DOCUMENT RESUME

ED 145 206 CE 013 042

AUTHOR Williams, Michael J.; And Others
TITLE A Curriculum Guide for Industrial Arts Activities for the Elementary School Educable Mentally Retarded Student.
INSTITUTION Central Connecticut State Coll., New Britain. School of Technology.
PUB DATE May 77
NOTE 104p.; Best copy available

EDRS PRICE MF-$0.83 HC-$6.01 Plus Postage.
DESCRIPTORS Aptitude Tests; Curriculum Guides; *Educable Mentally Handicapped; Educational Legislation; Elementary Education; Federal Legislation; *Individualized Instruction; *Industrial Arts; *Learning Activities; Middle Schools; Regular Class Placement; Special Education; Student Characteristics; Student Evaluation; *Student Projects; Teaching Techniques; Vocational Education

ABSTRACT

The curriculum guide contained in this document was developed to illustrate to teachers of educable mentally retarded (EMR) students, at the elementary and middle school levels, how hands-on activities can be used to complement academic subjects by bringing instruction down from an abstract to a concrete level. The guide is also designed for use by industrial arts instructors working with mainstreamed educable mentally retarded students alone or in cooperation with a special educator. Major discussion centers on (1) recent legislation; (2) the individualized education plan; (3) environmental and learning characteristics of the EMR; (4) teaching methods appropriate for EMR students; (5) industrial arts objectives for EMR students; (6) an example of a pretest to allow the instructors to ascertain a student's knowledge level and manual skills ability with regard to tools used in hands-on activities; (7) suggested projects including a description of the project, the materials and tools required, the construction procedure, pre-project preparation suggestions for the special education and industrial arts instructors, behavioral objectives related to the project; and a working drawing of the project; and (8) a tools and supply list. An evaluation form that can be used by the instructor to measure student comprehension, performance, and attitudes at the end of the project construction activities, a vocational behavior rating scale, and a bibliography are appended. (Author)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED145206

A Curriculum Guide for Industrial Arts Activities for the Elementary School Educable Mentally Retarded Student

BEST COPY AVAILABLE

By

Dr. Michael J. Williams
Mr. Richard E. Hardy II
Mr. Richard A. Sanda

May, 1977

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Michael J Williams
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND THE ERIC SYSTEM CONTRACTORS."

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

School of Technology
Central Connecticut State College
New Britain, Connecticut

BEST COPY AVAILABLE

OE 01 3 042

Table of Contents

Acknowledgements (page 1)

Introduction (page 2)

Recent Legislation (page 4)

Individualized Education Plan (page 6)

Environmental and Learning Characteristics (page 12)

Teaching Methods for EMR Students (page 14)

Industrial Arts Objectives for EMR Students (page 15)

Industrial Arts Pretest (page 17)

Projects (page 27)

Industrial Arts Posttest (page 73)

Suggested Tools (page 75)

Supplies (page 74)

Appendix I (page 76)

Appendix II (page 81)

Bibliography (page 86)

Acknowledgements

We would like to thank the following group of people for their time, effort, and involvement.

Pat Curran

Jim Almeida

Jan Reitler

Heather Turo

Nancy McGugan

Kathy Rodrigues

Peter Rodrigues

Norman Grabowski

The People at Stanley Tool Co.

Special thanks to JoAnn Messina, special education instructor at Stanley Street School. Without her help and co-operation this guide would not have been possible.

INTRODUCTION

One of the primary goals of education is to teach children to become active, self-supporting adults. Whatever these children become, they should be taught that each person has his or her part to do in making the community and the world a better place to live. They should be taught that any job well done is deserving of praise and self respect.

The aforementioned paragraph is especially true of the EMR or Educable Mentally Retarded Child. For numerous reasons, both medical and social, these children develop mentally at about 1/2 to 3/4 the rate of the "average" child. They range in I.Q. from 50 to 80 and usually "plateau" at an intellectual level not exceeding sixth grade. In conjunction with this academic deficiency they often have personal problems tht are both related and non-relted to their deficiency.

The EMR Child needs educational programs that pertain to his or her individual needs. Public Law; 94-142 states that these children have the right to special programs of individualized education.

Through an educational program involving Industrial Arts Activities, these children can be taught the neccessary skills needed to become self-supporting, self-respecting adults.

This guide has been developed with the intent of demonstrating to teachers of EMR Students, at the elementary and middle school levels, how hands on activities can be utilized to complement academic areas by bringing instruction down from an abstract level to a concrete or practical level that is more easily comprehended by the EMR.

The guide suggests projects, materials, tools, necessary teacher preparation and behavioral objectives which are specifically designed to help the EMR develop social skills, academic skills and sensory-motor skills. The activities described in this guide could be done by the elementary school special educator alone, if he/she has some knowledge in basic hand tools and materials, or in conjuction with an industrial arts teacher who is located in the school or in another school in the system.

The projects described herein were all developed with the joint cooperation of a special educator and two industrial arts teachers-in-training. The projects were built by elementary school level (grades 5 and 6) EMR students at Stanley Street School, New Britain, Connecticut.

Recent Legislation

Recent Legislation for handicapped students indicates that the public, the government and educators are finally recognizing that handicapped people have the same right to an education as everybody else. Handicapped people are also a valuable untapped resource.

One new law, Public Law 94-142 - enacted in November 1975 is the broadest, boldest piece of legislation ever, for handicapped students. Hailed as the "Bill of Rights for the Handicapped", this may well be the end of educational discrimination of handicapped people through-out the nation.

Each school system will recieve an allocation of federal funds for programs for each handicapped student enrolled in the system. Placement tests are presently being prepared to measure individual handicapped students' abilities for placement in school systems. These tests must be neither racially nor culturally discriminatory. From the results of the tests along with interviews with both the students and the parents, an individualized education plan will be agreed upon and properly arranged.

Handicapped students will be mainstreamed whenever possible. Similarly, when a group of students with like handicaps can benefit from a learning experience together, a special class program with special facilities will be developed and conducted by qualified persons.

Since Educable Mentally Retarded Students are mentally handicapped, they will be among those students who will be able to seek and receive educational help because of PL 94-142. By Fiscal Year 1978, a minimum of 75% of the federal funds will be passed through to local schools. This means that activities such as the ones described in this curriulum guide should not be withheld from the EMR Student.

In short, PL 94-142 will:

- Guarentee due process.
- Assure that individualized education plans will be developed and implemented for each handicapped student.
- Assure nondiscriminatory testing and evaluating of handicapped students.
- Protect the confidentiality of student records.
- Provide for the least restrictive educational environment for handicapped students.

Individualized Education Plan

Individualized Education Plans (IEP'S), should be written in educational terms designed to assist instructional personnel in selecting and utilizing appropriate educational materials and strategies. These programs should include the following criteria:

1. An analysis of the student's present achievment level: this will include academic achievment, ie. how the student's mental age coincides with his chronological age, social adaption, prevocational and vocational skills, psychomotor skills and self help skills.
2. Long range goals for the student: this will include goals that are to be achieved by the end of the school year.
3. Short range goals: these goals may be daily, weekly, bi-weekly or monthly and should be measurable steps between the child's present level of achievment and the long range goals.
4. Specfic services that will be provided towards meeting these goals: this section will include all special education and related services which are needed to meet the unique needs of the child, including the type of physical education program the child will participate in and any special instruction media and materials that are needed. The IEP will not be limited by local availability of such services.
5. A date when specfic services will begin and the length of time they will be provided.

After determining if the child will receive special educational services, the Planning and Placement Team (PPT) has twenty-five (25) school days to develop an individualized education plan. The IEP should be implemented as soon as possible, but in any event must take no longer thatn twelve (12) weeks after determining that the child needs special educational programs.

6. An indication of the extent to which the student will participate in a regular classroom. After careful analysis of the child's present level of achievement, attempts will be made to "mainstream" the child into a regular classroom. The PPT will consider the need to place the student in the most appropriate and least restrictive educational environment.

7. A justification for the type of educational placement which the child will have. Determination must be made as to the extent to which the the exceptionalities impede the possibility of a child progressing at an appropriate level of functioning in a regular classroom and the educational strengths and weaknesses of the child in order to identify learning modes and the impact of the exceptionality on the attitude and emotional responses of the child to the learning environment.

8. Evaluation procedures to determine if goals are attained. This must be done on at least an annual basis to determine whether or not the short range goals are being achieved.

Before development of the IEP certain assesment procedures should be taken into consideration.

As a minimum requirement, these assessment procedures shall:

1. Be provided and administered in the child's dominant language or other mode of communication.
2. Be valid for the specfic purposes for which they are being used.
3. Be administered by personnel who are appropriately certified and/or licensed by the state.
4. Seek relevent information from sources other than ability of achievement tests, including information concerning physical condition, socio- cutural background and adaptive behavior in home and school, to be gathered and considered.
5. Not allow for one test or type of test or other means of evaluation to serve as the sole criterion of placement.

Individualized Education Plan

(Sample IEP)

Student: John Smith Date 5/1/77

Age: 11 Grade Level 4

1. Present Levels of Educational Performance:

   a. Academic Achievement: Presently functioning at grade level 3 in mathematics and reading, and grade level 2 in social studies.

   b. Social Adaption: Gets along well with peers and instructors.

   c. Prevocational and vocational skills: Work is sloppy due to rushing through tasks.

   d. Psychomotor Skills: Good. Some eye-hand coordination problems.

   e. Self Help Skills: Motivation and effort lacking.

2. Long Range Goals:

   a. Independence-full time work placement with minor supervision.

   b. Submit work of acceptable quality (acceptable should be defined).

3. Short Range Goals:

   a. Will be able to do all assigned tasks without having to be reminded that he is working too quickly.

   b. Will socilaize less with teachers and peers while in class.

4. Specfic services that will be provided towards meeting these goals:

   a. John will be given specfic directions by all teachers as to what is expected in each task assigned.

   b. John will be monitored closely in his classes by instructors and/or aides.

   c. John will complete all tasks satisfactorily or he will have to repeat the task.

   d. John will be assigned to the resource room for 3 periods a week during the marking period from February to June and will be assisted in achieving the previously stated goals.

   e. Meetings will be held each month with John's parents in order that they may carry on the behavior modification strategy being used in the resource room.

5. Date when specfic services will begin and the length of time they will be provided:

   a. Student behavior modification program will be opertional during the February to June marking period.

   b. John will report to the resource room 3 periods each week of the February to June marking period.

6. Indication of the extent the student will participate in a regular classroom:

   a. John will participate in all aspects of the regular school program. His attendance in the resource room will be during his study periods.

7. Evaluation of goal achievement:

a. Each instructor involved will utilize a rating scale of 1-5 with 1= poor and 5= excellent, to evaluate John's progress towards the long range and short range goals stated above. All teachers will use the same form with the exception of certain modifications to pertain to a particular class.

8. Evaluation procedures to determine of goals are attained:

a. John will be evaluated every two weeks during the February to June marking period by each of his instructors who will utilize the 1-5 rating scale.

b. PPT meetings will be held at least once a month from February to June where John's progress will be discussed by all instructors involved and any necessary revisions in John's program will be made. A collective file will be kepted on each child incorporating all teachers' evaluations.

(An evaluation form of Vocational Behavior Criteria can be found in the appendix of this guide).

Learning and Environmental Characteristics Of The EMR

Learning Characteristics :

1. The child is not ready for reading, writing, arithmetic and spelling when he enters school at the age of six unless he has special abilities. He does not begin to acquire these skills until eight or even eleven years of age. This delay is related to the child's mental age.

2. The EMR Children develop mentally, about one-half to three quarters the rate of the "average" child. Thus, they cannot be expected to cover a year's material in a year's time.

3. At the end of formal education, achievment will probably have reached second to sixth grade level, depending on mental maturation and/or special abilities.

4. I.Q. ranges from 50 to 80.

5. Mental development may include slowness in maturation of intellect needed for school work such as; slow memory for auditory and visual materials, generalizing ability, language ability, conceptual and perceptual abilities, imagination and creative abilities and other functions considered basically intellectual.

Environmental Characteristics :

There are no basic social traits that differentiate the EMR from the "average" child. The following are by-products of the difference between the expectancy of society and the ability of these children to cope with them.

Environmental Characteristics (cont) :

1. Short attention span, lack of concentration and participation often occurs when expecting these children to respond like other children in a regular classroom, the EMR Child cannot learn or understand at this level. When materials are geared to their level these characteristics generally disappear because their ability to succeed is greatly increased.

2. Low frustration tolerance of the EMR can be related to the fact that the child is expected to function to his chronological age rather than his mental age and, because he cannot do this, he fails in many experiences both inside and outside of school. Tolerance for frustration can be increased by experiences at home and at school that will afford successful experiences.

3. Social values and attitudes generally correspond to the home and neighborhood environment where the child is reared.

4. The EMR's play experiences are more closly related to the child's mental age rather than his/her chronological age.[1]

It cannot be stressed enough that, for the EMR Child to overcome many of these difficulties, materials must be so arranged to almost guarantee success.

---

1. Educating Exceptional Children, Samuel Kirk, Houghton Mifflin Company, Boston, 1972, p, 195-196.

Teaching Methods Applicable to The EMR When Engaged in Industrial Arts Activities

1. The special education instructor should reinforce the skills presented by the industrial arts instructor. While help may not be practical with actual projects, much help can be given in such areas as:
   a. Assisting with notebooks
   b. Teaching of Vocabulary
   c. Teaching of measurement
   d. Material identification, such as equipment, etc.
   e. Correlating classroom activities with the industrial arts projects.
2. The teacher should present materials and projects of a concrete, practical nature that have meaning to the students.
3. The teacher should establish realistic standards that the students can understand,
4. The teacher should include a minimum amount of reading, writing and spelling applicable to industrial arts activities.
5. The teacher should not assume that the students are familiar with even the most elementary steps. What the average child may know when entering the class must be specifically taught to the EMR.
6. Conferences between the industrial arts instructor and the special education teacher in which ratings on intelligence tests and achievement tests are shared should prove most helpful.

Objectives To Be Accomplished Through The Use Of Industrial Arts Activities With The Educable Mentally Retarded Student.

The inclusion of industrial arts (hands on) activities in an elementary school class which includes special needs students can facilitate accomplishment of the following objectives:

1. To develop the individual's abilities to work with others and to share tools.
2. To assist in the development of the ability to follow directions.
3. To develop self-reliance and self-respect.
4. To establish an understanding of the uses and care of various tools and equipment.
5. To develop a knowledge and practice of safety.
6. To improve hand skills and cordination.
7. To establish more worthy home membership through the development of abilities in performing helpful household tasks.
8. To encourage the students through learning the basic operation of hand tools.
9. To develop some understanding of the differences found in the basic materials of industry.
10. To open areas of endeavor that may lead to economic independence.
11. To open areas of endeavor that may lead to worthwhile leisure time activities.
12. To work toward task completion.
13. To attend to a task for a specfic amount of time.

14. To understand how wages and hours are related.
15. To understand various jobs and their requirements.
16. To use proper language.
17. To know what is expected to do a job well.

Pretest

The pretest is a test to be administered to each individual educable mentally retarded student at the onset of the Industrial Arts Program. This test is designed to enable the instructor to ascertain the individual student's knowledge level and manual skills ability. This understanding will facilitate the writing of a more realistic individualized educational plan for each student.

The instructor must have a knowledge of proper tool use before attempting to administer either the tests or the program projects. If the instructor is not trained in proper tool usage, he/she should consult an Industrial Arts Teacher or other qualified person.

The test should take place at a suitable work table with all the tools and materials gathered on the table. Any activity other than the intended questioning, answering, and demonstration may only add confusion. Thus the test results may be altered.

Procedure;

In a one-on-one interaction, the instructor will first ask the student to correctly name each tool as it is presented to him/her. The student's answer will be recorded by the instructor in the appropriate column of the Pretest Answer Form.

The tools for the pretest have been selected and ordered in a fashion such that the operations performed with each tool will sequence the operations to be performed with the tool that follows.

The next step is to ask the student if he/she will hold the tool properly as if to perform an operation with the tool. Here the instructor's knowledge of the tool is necessary. Record the student's demonstration in the appropriate column on the Pretest Answer Form.

The final step is to ask the student to demonstrate the use of the tool. Here again the instructor's knowledge of the tool and proper usage is needed. Record the student's demonstration on the Pretest Answer Form.

Certain dimensions and directions must be conveyed to the student for each tool to secure a proper sequence of activity. The following set of directions are intended to serve as a guide that could be used by the instructor in testing the students. The actual question and the terminology will be determined by the instructor according to the student's ability to comprehend. These directions will be used to direct the student's tool use activities.

Directions to Students for each Tool

1. 12" Dual Scale Ruler

   a. Measure the long side of the block.
   b. Mark the block 4"s from one end of the block.

2. Tri-Square

   a. Use the tri-square to make a line straight accross the block at the 4" mark.

3. Bench Vise

   a. Clamp the bench vise to the work table surface.
   b. Clamp the block in the vise so that the line is visible.

(cont.)

4. Hand Saw

a. Use the Crosscut Saw to cut the block on the line.
b. Move the block in the vise if necessary.

(Instructor- Help the student rearrange the block for this cut.)

5. Hand Drill

a. Use the hand drill to drill a hole in the end of the long block.

(Instructor- Help the student rearrange the block for the practical use of the hand drill.)

6. Screw Driver

a. Use the screw driver to screw a screw into the hole previosly drilled in the end of the block.

(Instructor- Utilize the proper bit for the the selected screw size.)

7. Hammer

a. Use a hammer to nail three (1") brads into the end of the block opposite the screw.

8. C-Clamp

a. Clamp the small block to the work table with one end of the block clearly off the edge of the work table.

9. Surform

a. Use the 12" surform to round-off the end of the block.

(Instructor- Interpret "round-off" for the student)

10. Sand Paper

a. Use sand paper to smooth rough edges and surfaces.

Instructor- Refer to the Instructor's Pretest - Posttest Form.

Instructor's Pretest - Posttest Form

The Pretest - Posttest is a measuring tool for you, the instructor, to measure the students knowledge and skill of specific tools. Questions should be worded according to the student's vocabulary level. When testing a class, use the same wording for each student. Do not help the student if they do not know the answer or are unable to complete a step. Be sure to test for all listed tools. Insist on the students' wearing safety glasses.

The following are examples of types of things the instructor should check for during the test.

Tool	Ident.	Grip	Use
Hammer	Hammer	a. Face down. b. Hand proper distance from head.	a. Swing straight. b. Hit nail with center of face c. Hand proper distance from head.
Sand Paper	Sand Paper Abrasive Paper Sanding Paper	a. Rough side down. b. Used with block.	a. Move with grain.

If the student does not perform to minimum level, do not check column "Yes". Instead, write in the space provided what type of misuse or lack of skill the student exhibits.

Industrial Arts Pretest-Posttest Form (circle one)

Student Name_____
Date_____

TOOL	IDENTIFICATION (YES) (NO)	PROPER GRIP ON TOOL (YES) Describe	PROPER USE OF TOOL (YES) Describe
RULER			
TRI-SQUARE			
BENCH VISE			
HAND SAW			
HAND DRILL			
SCREW DRIVER			
HAMMER			
C-CLAMP			
SURFORM			
SAND-PAPER			

MATERIALS FOR PRETEST

1. Dual Scale Ruler(12")
2. Tri-Square
3. Bench Vise
4. Hand Saw (crosscut)
5. Hand Drill
6. Screw Driver
7. Hammer (12 oz.)
8. C-Clamp
9. Surform
10. Sand Paper
11. Pencil
12. Brads (1")
13. Pine Board (3/4x2"x6")
14. Sanding Block

Workshop

Description of Experience:

The workshop on tools should be the first activity. This activity is for hands-on learning of tool names and tool use. The emphasis of the experience should be based in part on the students' performance on the Pretest.

Materials and Tools Required:

Materials	Tools
1. Clear Pine 3/4x2"x6"	1. Crosscut Saw
2. 1½" finish nails	2. Bit Brace
3. Elmer's Glue	3. 3/8" Auger Bit
	4. Colored Markers
	5. 12" Dual Scale Ruler
	6. Pencils
	7. Bench Vise

Procedure:

1. Explain templates and their use.
2. Place the 4" template on the block, flush with one end. Mark the block.
3. Explain the Tri-Square.
4. Use the tri-square to draw straight line accross the block.
5. Explain the crosscut saw and it's proper use.
6. Use the crosscut saw to cut the block on the line.
7. Explain the hammer, it's proper use.
8. Use the hammer to nail the short section onto the long section. Pound two-1½" nails through into the short section.

9. Use the ruler and the tri-square to mark the end of the long section for drilling. (Refer to drawing for detail).

10. Explain the Auger Bit and the Bit Brace.

11. Use a 3/8 auger bit in conjunction with the bit brace to drill a hole 1½" deep into the end of the long section.

12. Have students put initials on the pencil holder.

Preparation:

The I. A. Instructor should:

1. Make ready 1 block (3/4x2"x6") of clear pine for each student plus one for a prototype.

2. Make a prototype.

3. Make a 3/4x2"x4" block template.

4. Gather hardware and tools at work benches.
   A. Bench Area I
      1. Vises
      2. Tri-Squares
      3. Crosscut Saws
      4. Pencils
      5. Template (4" block)

   B. Bench Area II
      1. Vises
      2. Hammers
      3. Box of nails

   C. Bench Area III
      1. Vises
      2. Auger Bit
      3. Bit Brace
      4. Tri-Squares

Note- If the work area is small- Bench I, II, III can be the same work bench with a tool clean-up between steps. Unused tools should be put away.

The Special Education Teacher should:

1. Familiarize the students with tool shapes and corresponding names.

2. Have students make a bulletin board by cutting out tool shapes and labeling them.

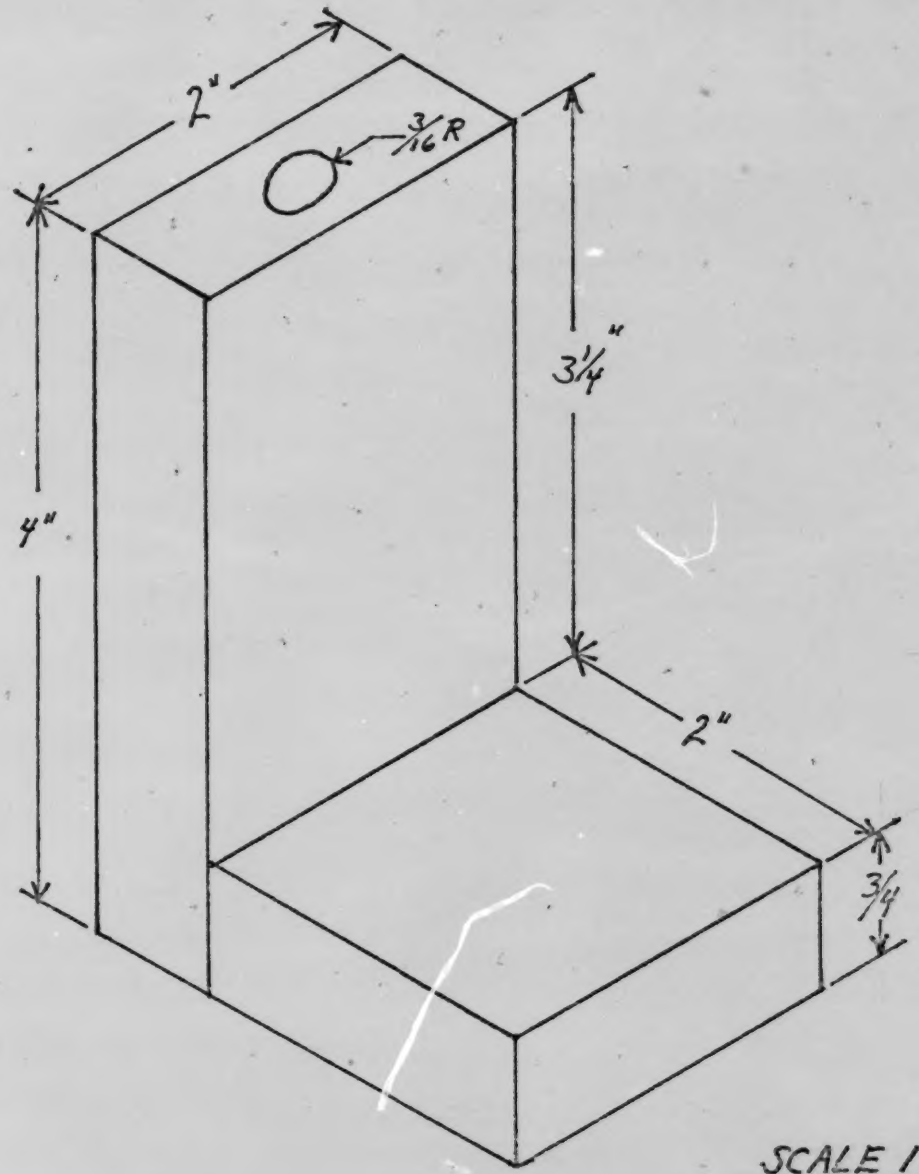
3. Reduce any fear students may have reguarding tools. Stress safety.

4. Stress the use of safety glasses.

5. Explain the workshop as a time to learn tool names and how to use them.

6. Make charts for clean-up assignments and for project completion.

WORKSHOP



SCALE 1"-1"

Project # 1

Ruler

Description of project :

The ruler is made from a piece of birch strip 1/8"x1"x12". It has markings at 1/4", 1/2" and 1" intervals. The main purpose of this project is to introduce the student to the concept of measurement and part-whole relationships.

Materials and Tools Required :

Materials	Tools
1. Birch strip 1/8"x1"x12"	1. Sandpaper 100 grit
	2. Ruler
	3. Pencil
	4. Black marker
	5. Tri-square

Procedure

1. Obtain a piece of birch strip 1/8"x1"x12".
2. Clean and smooth all surfaces with sandpaper.
3. Using a ruler, measure and mark the birch strip at 1/4" intervals.
4. Using a tri-square, draw different length lines to represent the intervals.
5. Number the inch lines 1 - 12.
6. Have the students write their names on the back of the rulers.

Preparation :

1. The I.A. Instructor should :

Preparation (cont)

a. Make Prototype.

b. Pre-cut birch strips.

c. Develop introduction on measurement and the use of a ruler.

2. The Special Ed. Instructor should :

a. Introduce the students to the concept of measurement in 1/4", 1/2" and 1" increments.

Behavioral Objectives :

1. Upon completion of this project the student will;

a. Be able to measure 12" in 1/4" increments.

b. Be able to transfer measurements from a ruler to another piece of material.

c. Demonstrate that he can identify the various increments on a ruler.

d. Demonstrate the correct use of sandpaper.

e. Demonstrate the correct use of the tri-square.

2. As a result of this project the student will develop the following sensory-motor skills :

a. Visual discrimination by being able to differentiate between the different increments on the ruler.

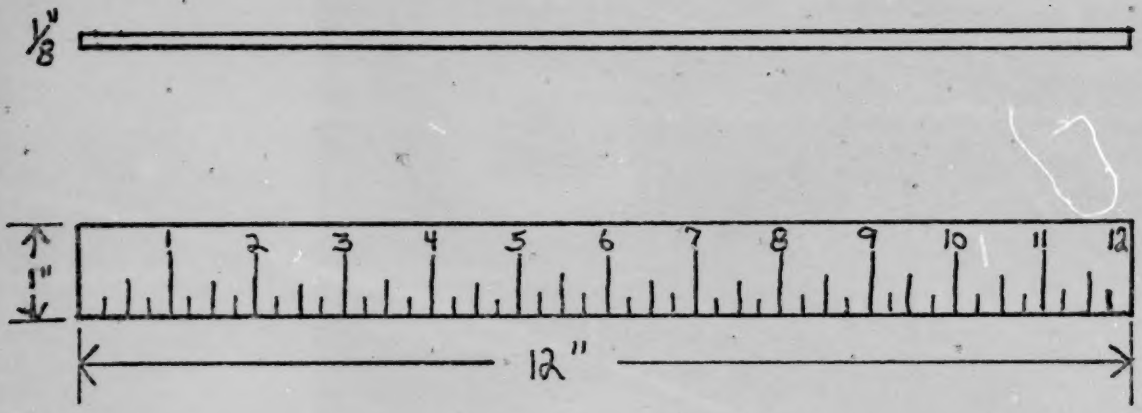
b. Number sequence by seeing the order of the numbers from 1 - 12.

c. Eye-hand cordination through the process of transfering lines from a ruler to another piece of material.

d. Part-whole relationships, the student will realize that 2 half-inches equal 1 inch and that 12 " equal one foot.

Behavioral Objectives (Cont)

3. By completing this project the student's imagination will be stimulated by describing the different ways a ruler can be used.
4. As a result of this project the student's sense of responsibility will be increased by being instructed to bring the ruler to the class for I.A. Activities.



SCALE 12" = 1"

Project # 2

Owl Doorstop

Description of project :

The owl is cut from a 1/4"x4½"x6" piece of plywood. The base is a preformed piece of 1"x3"x4" fir. The owl is cut with a coping saw and is attached to the base with 3 #6 round head screws. The entire project is then spray painted.

Materials and Tools Required :

Materials

1. 1/4"x4½"x6" piece of plywood
2. 1"x2"x4" piece of fir
3. 2 #6x3/4" round head wood screws
4. Paint

Tools

1. Sandpaper 100 grit
2. Owl template
3. Coping saw
4. Screwdriver
5. Half-round file
6. Hand drill
7. 1/8" drill bit
8. C-clamp
9. Bench vise
10. Pencil

Preparation :

1. The I.A. Instructor should :
   a. Make prototype.
   b. Pre-cut wedge shaped base.
   c. Have directions ready so the students know exactly what you want them to do.

Procedure :

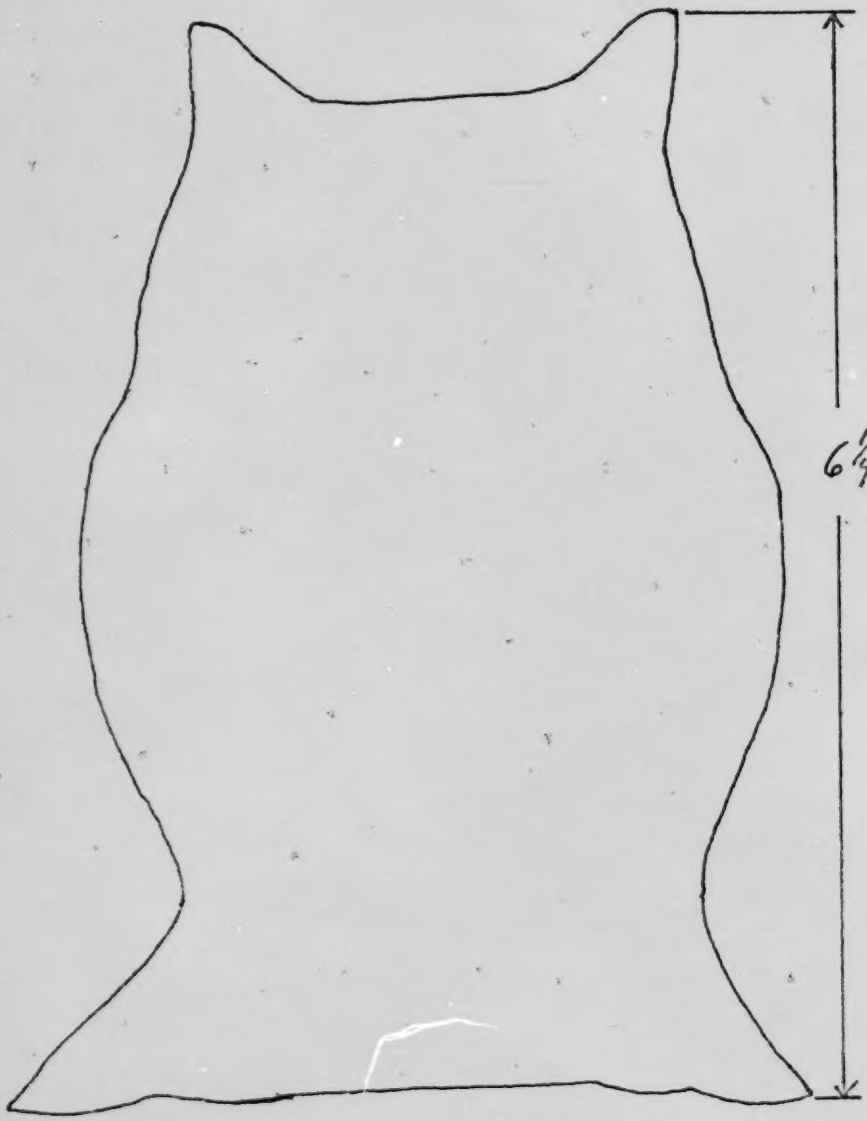
1. Trace the template on piece of plywood.
2. Cut out shape of owl with coping saw.

Procedure (cont) :

3. Smooth all rough edges with sandpaper and/or file.
4. Drill two small starter holes in owl and base.
5. Attach owl to base with two screws using screwdriver.
6. Clean all surfaces.
7. Paint.

Behavioral Objectives :

1. Upon completition of this project the student will be able to correctly identify and use the following tools :
   a. Coping saw
   b. Screwdriver
   c. Hand drill
   d. Template
   e. Half-round file
   f. Sandpaper
2. The student will demonstrate the ability to transpose a shape to another object with the aid of a template
3. The student will demonstrate growth in self-confidence by allowing him/her to work on their own as much as possible.
4. The student will develop eye-hand cordination by tracing the template and cutting the owl out with a coping saw.
5. The student will develop socially by working with others.
6. The student will develop color discrimination along with thinking skills by conversing with the instructor as to the color of the project.



OWL DOORSTOP

6¼"

SCALE 1"=1"

4"

Project #3

Candlestick Holder

Description of project:

The candlestick holder is made of clear pine, 1/2" x 4" x 4", and 3/4" x 3" x 3". There are three pieces of material in this project; a large hexagon, a star, and a small hexagon with a 7/8" hole in the center for a candle. The pieces are held together with Elmer's Glue.

Materials and Tools Required:

Materials

1. Clear pine, 1/2" x 4" x 4" & 3/4" x 3" x 3"
2. Elmer's Glue
3. Paint or stain
4. Candles

Tools

1. Sandpaper - 100 grit
2. Coping saw
3. Half-round file
4. Small surform
5. Template for each piece
6. Bench vise
7. C Clamp
8. Hand drill and 1/8" bit
9. Bit brace and 7/8" bit

Procedure:

1. Trace template onto material.
2. Drill small pilot hole in the center of the small piece of wood (this will eliminate the wood from splitting).
3. Drill 7/8" hole in the center of small piece of wood.
4. Cut out shapes with coping saw.

Procedure (cont.):

5. Smooth all rough edges and lines with a sur-form, a half-round file or sandpaper.
6. Place small amount of glue on star shape and center it on the large hexagon.
7. Place small amount of glue on small hexagon and center it on the star.
8. Let glue set for several hours before handling.
9. Paint or stain.

Preparation:

1. The I.A. Instructor should -
   a. Pre-cut wood to 1/2"x4"x4" and 3/4"x3"x3" pieces.
   b. Make templates of each shape.
   c. Make prototype.
   d. Ensure that all materials and tools are available.
   e. Be certain that the students know exactly what you want them to do.
2. The Special Ed. Instructor should -
   a. Explain to students how candles were used in the past (i.e. lights, signals, etc.).
   b. Explain safety precautions when using candles.
   c. Possibly give a brief presentation on how candles were made in the past and how they are made today.
   d. Have students make candles to fit candle holders.

Behavioral Objectives:

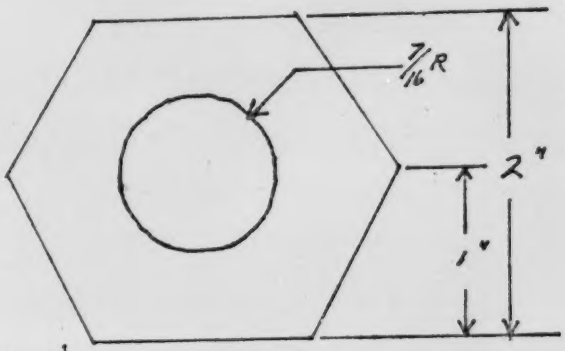
1. Upon completion of this project, the student will be able to correctly identify and use the following tools:
   a. Template
   b. Coping saw
   c. C Clamp
   d. Bench vise
   e. Sur-form
   f. Half round file
   g. Sandpaper
2. As a result of this project the student will develop the following sensory-motor skills:
   a. By using the coping saw to cut a line, the student will develop eye-hand coordination.
   b. Because there are three pieces to this project that the student will have to assemble, she/he will develop the concept of part-whole relationships.
   c. Because there are different shapes in this project which the student must recognize, he will develop shape recognition.
   d. The student will develop her/his ability to follow instructions by following the procedures for the project.
3. The student will develop self-confidence by working on her/his own as much as possible without the instructor's assistance.
4. The student will develop compatibility by working with

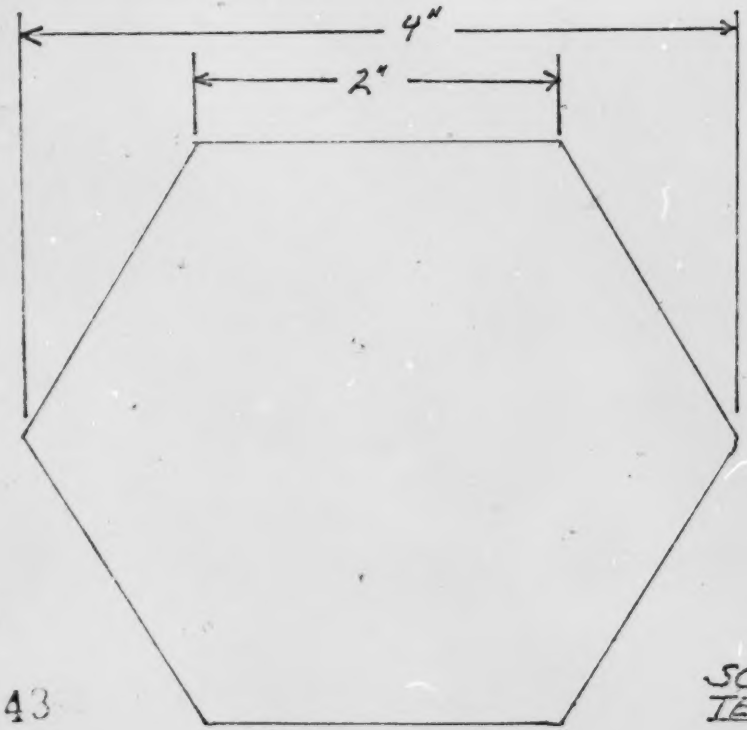
Behavioral Objectives (cont.):

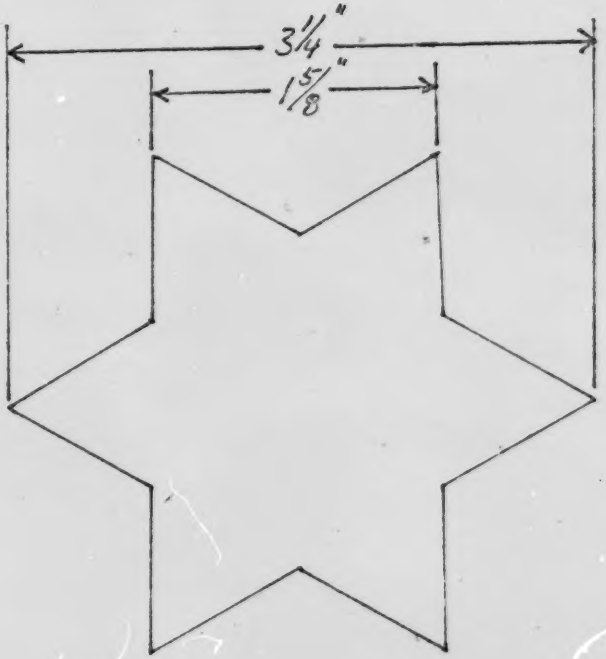
and sharing tools with the other students.

5. By constant praise the student will develop a sense of worth.
6. The student will develop problem solving skills and color discrimination by choosing the color for his project .
7. Through a successful experience the student will be motivated to pursue future learning experiences.

CANDLE STICK



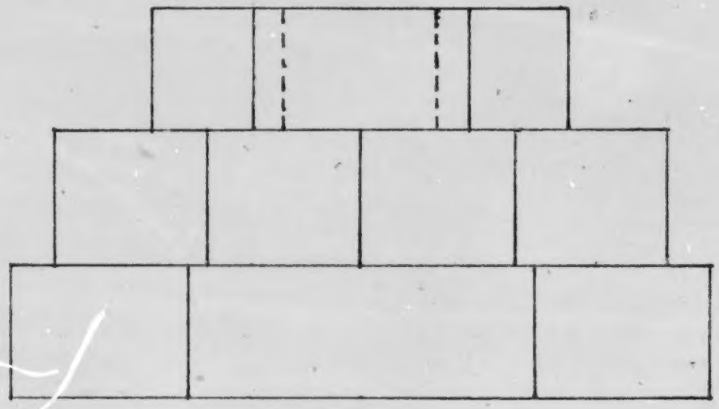


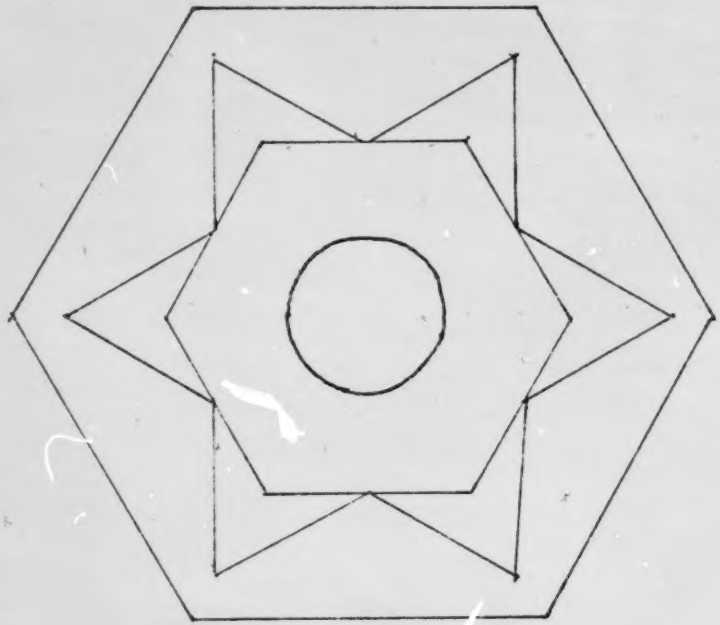


SCALE 1" = 1"
TEMPLATES

43

CANDLE STICK





FRONT AND SIDE VIEW
SCALE 1"=1"

Project # 4

Mass Production Project

Stacking Block Game

Description of Project:

The stacking block game is comprized of five parts. The parts are a 3/4"x4"x4" base with a 3/8"x5" dowel in the center of the base, a 3/4"x3"x3" small square with center hole, an equalateral triangle that is 3" on each side and a center drilled hole and an octagon with a center drilled hole. (Refer to drawing for more details) This game is to be mass produced with the intent of simulating industry. After the games are produced, they will be donated to a pre-school or kindergarten class to reinforce the concept of giving without always receiving.

Materials and Tools Required: (based on 10 games)

Materials	Tools
1. 3/4"x4"x48" clear pine	1. 2 cross-cut saws
2. 3/4"x3"x80" clear pine	2. 3 Bit braces
3. 3/8"x50" fir dowel	3. 3 Auger bits 7/16"
4. Elmer's Glue	4. Back saw
5. Paint (various colors)	5. 8 C-Clamps
	6. Sandpaper 100 grit

Preparation:

1. The Industrial Arts Instructor should:
   a. Construct jigs and fixtures according to drawings, dimensions, and directions.

Preparation (cont):

b. Set up jigs and fixtures at stations .

c. Make a prototype.

d. Select and position tools at the stations.

e. Before work begins, review with students how industry takes processed materials into the factory -futher processes the material with jigs and fixtures. Discuss how the material is fashioned into a product and shipped out for delivery.

f. Explain to the class what is expected of them in as far as quality of production is concerned.

2. The Special Ed. Teacher should:

a. Discuss with students what mass production is and it's importance in our technological society.

b. Explain to the class the difference between jigs and fixtures. Show pictures, films,and slides of assembly lines, industrial jigs and fixtures.

c. Explain job positions such as workers, line formen,etc.

d. Set up a simulated production line to make peanut butter and jelly crackers. Assign each student a specific job to do.(ie. worker, line formen, quality control, supervisor, etc.).

e. Explain to the class that the Stacking Block Game will be a gift to the group of students.

Procedure:

1. Discuss with the class how industry uses jigs and fixtures.

2. Each jig-fixture needs a work group. Separate the students into the following work groups:

	No. Students
A. Base and Dowel Fixture - Assembly	4
B. Small Block Fixture	4
C. Triangle Fixture	4
D. Hexagon Cutting Fixture	2
E. Sanding	4
F. Red Paint	2
G. Yellow Paint	2
H. Blue Paint	2
I. Green Paint	2

3. Bring the class together at each fixture set-up and quickly explain what the steps are at the different fixture stations so that all the students will at least be exposed to all the different processes in the project completion.

Fixture Stations

Worker Titles For the Fixture Station Jobs

Station A.

1. Supervisor
2. Drill Person
3. Saw Person
4. Materials Handler

Sequence -Materials Handler clears the fixture of saw dust and chips, then feeds stock into the fixture.
-Drill person drills the stock in the locating hole of the fixture.
-Saw person cuts the stock off at the indicated slot.
-Supervisor removes finished peice from jig. Keeps process continuing.

Preparation (cont):

-When all the base sections are finished, the Saw Person and the Materials Handler are responsible for cutting a corresponding number of dowels on the specified section of that fixture. The Supervisor and Drill Person assemble base sections with dowel sections. Elmer's Glue is used.

Station B.

1. Supervisor
2. Drill Person
3. Saw Person
4. Materials Handler

Sequence -The Job responsibilities are the same for Station B as for Station A. Enough small blocks should be cut, 1 for each game to be produced. Then cut an equal number of small blocks to be Hexagons.

Station C.

1. Supervisor
2. Drill Person
3. Saw Person
4. Materials Handler

Sequence -The Job responsibilities are the same for Station C as for Station A. * The Supervisor is responsible for discarding the piece first cut from fresh stock. It is not a perfect triangle piece.

Station D.

1. Saw Person
2. Materials Handler

Sequence -The Saw Person cut sections off the piece in the fixture twice. For the third and forth cut a wedge is use to hold the piece in position. The Materials Handler is responsible for moving small block sections to the Hexagon Fixture and stacking finished Hexagons.

Procedure (cont):

Station E.

1. Sanders

Sequence -All unoccupied personel are to be engaged in sanding rough cut pieces. (FREE LANCE SANDING)

Stations F,G,H,and I.

1. Painters

Sequence -Two Painters are assigned for each of the four colors.

Red ----- Triangle

Yellow -- Hexagon

Blue ---- Small Square

Green --- Base

4. When all the Games are finished, have class present the games to recipient students. Try a party!

5. Review complete mass production project with students.

Behavioral Objectives:

1. Upon completion of this project, the student will be able to correctly identify and use the following tools:

   1- Crosscut Saw

   2- Auger Bit and Bit Brace

   3- Sandpaper, Surform, or File

2. The Student will demonstrate that he/she can follow directions by completing the tasks assigned.

3. As a result of this project, the student will develop the following sensory- motor skills:

Behavioral Objectives (cont):

a. Eye-hand coordination by the manipulation of the various hand tools.

b. Visual memory by remembering the various shapes.

c. Auditory discrimination through verbal expression of needs and stimulation by the instructor getting the student to verbalize a viewpoint.

4. The student will develop sequencial memory by understanding operation order and personal job sequence.

5. Since these games will be given away, the student will experience sharing and giving.

Extra Resources:

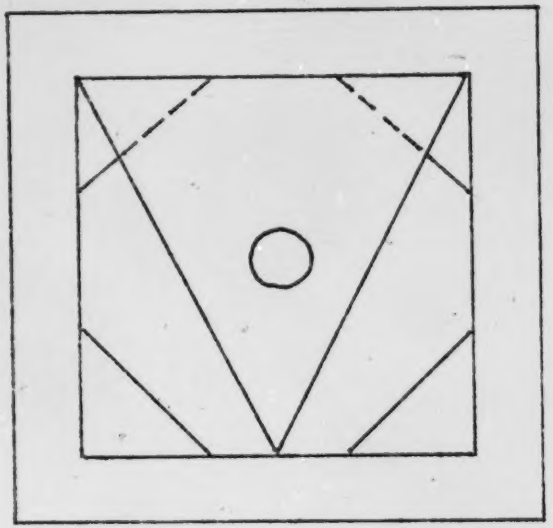
1. There are a number of good films available on on mass production that could be used to further explain mass production.

2. Field trips to local industry can be utilized to give the students a first hand feeling for the industrial mass production experience.

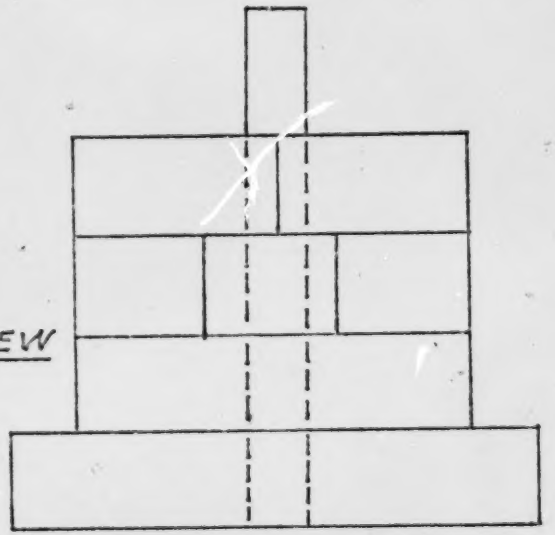
ALWAYS REMEMBER SAFETY GLASSES !!!

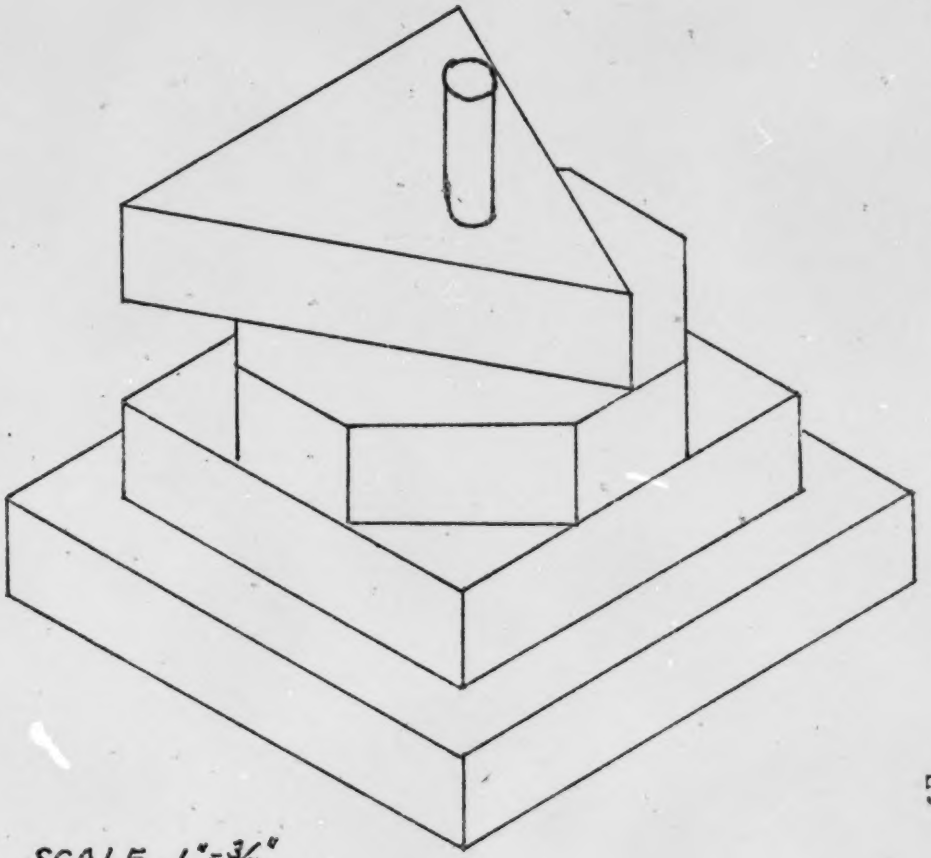
STACKING BLOCK GAME
MASS PRODUCTION

TOP VIEW



FRONT VIEW

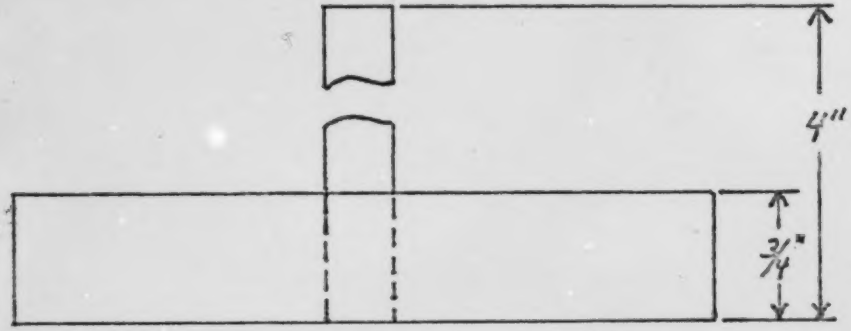


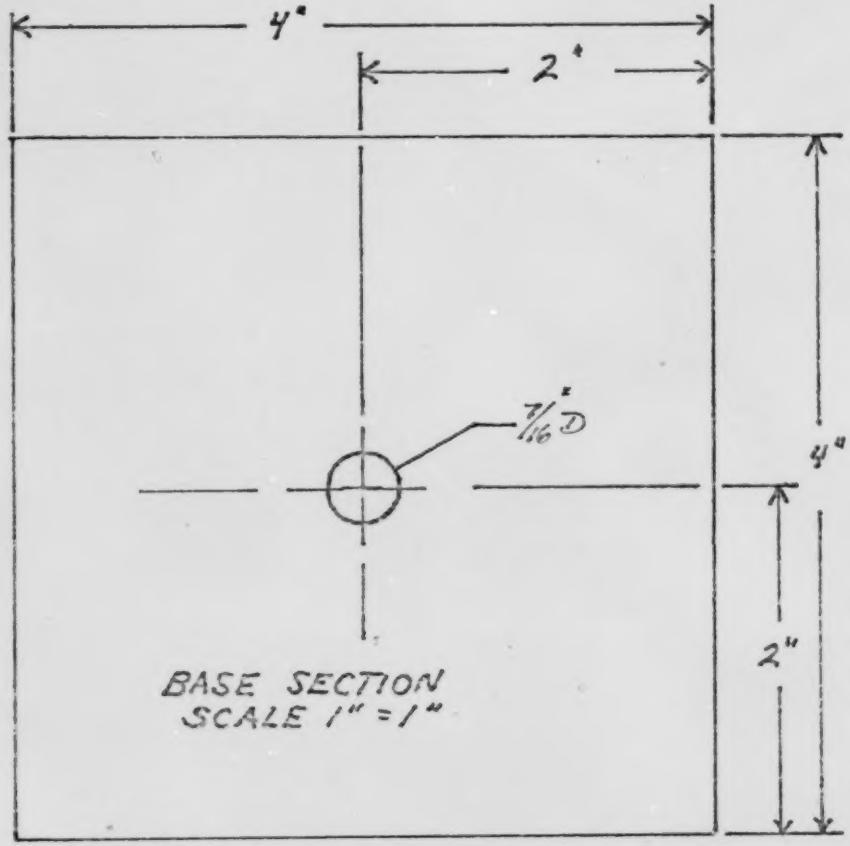


SCALE 1"=3/4"

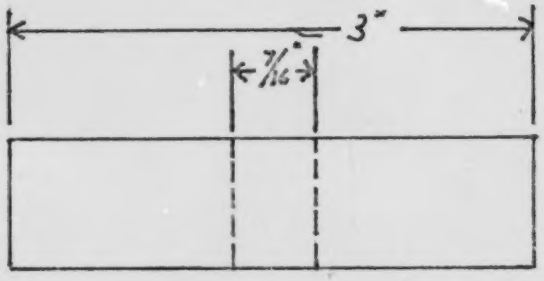
53

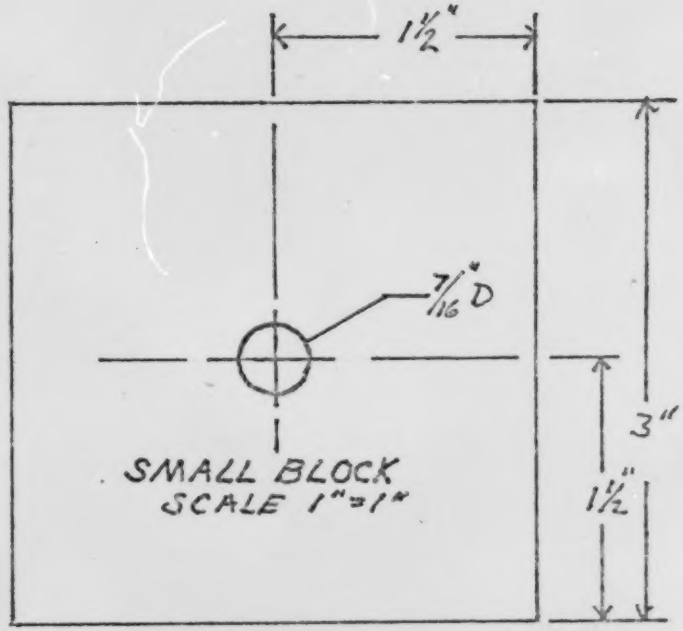
54





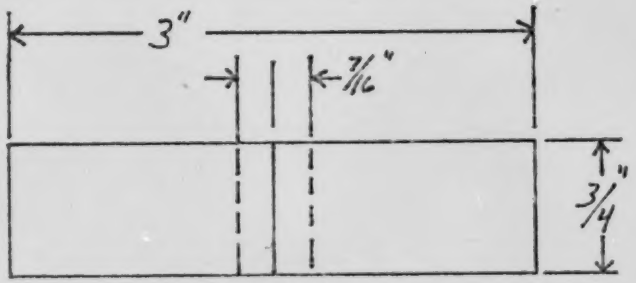
BASE SECTION
SCALE 1" = 1"

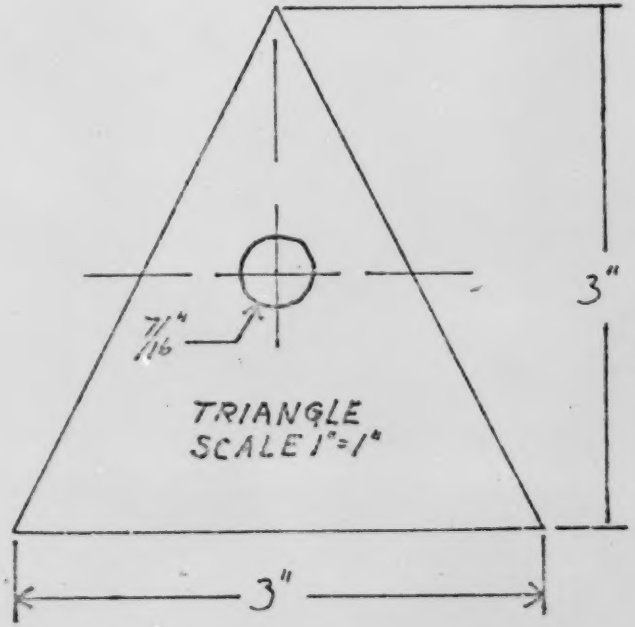




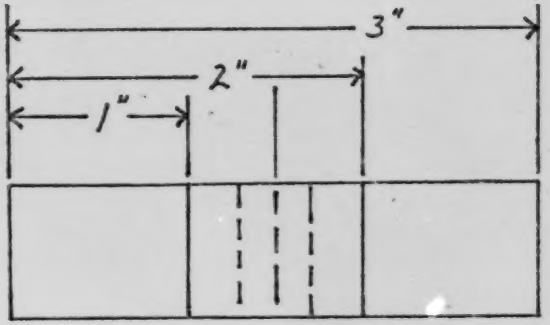
SMALL BLOCK
SCALE 1" = 1"

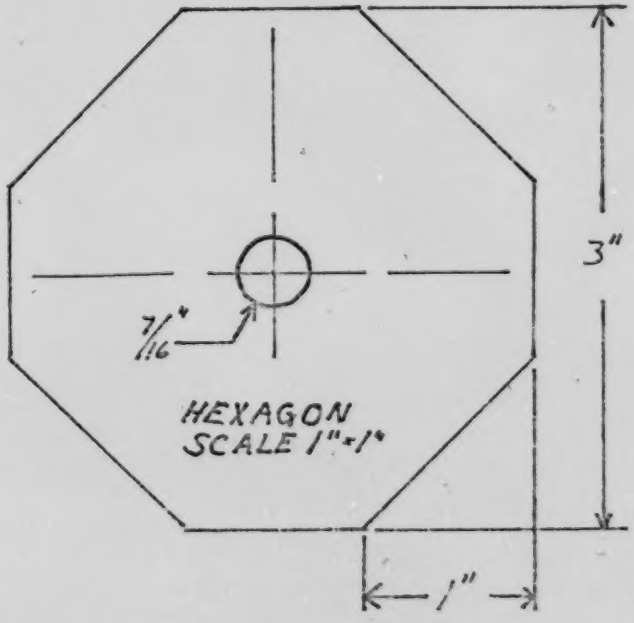
47.



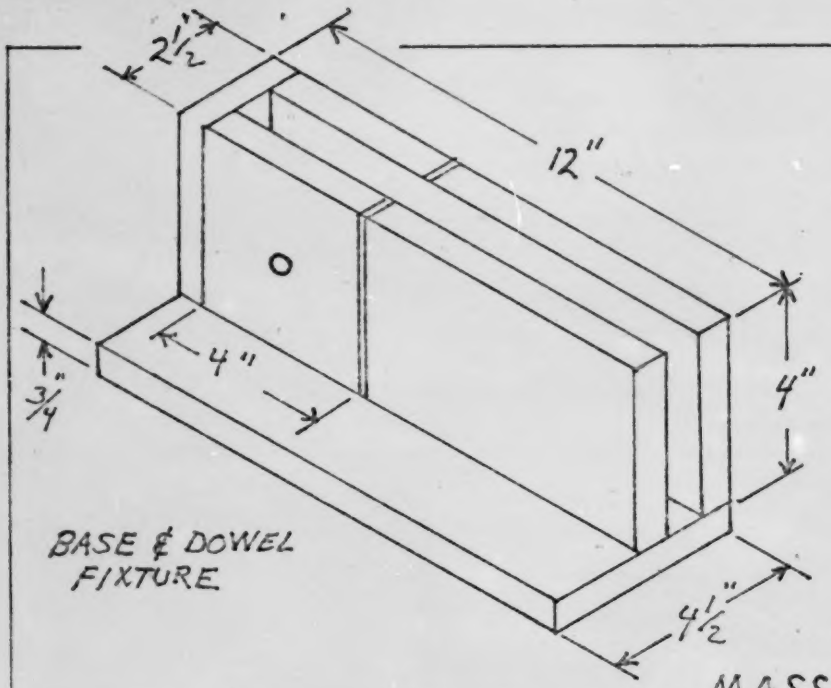


57

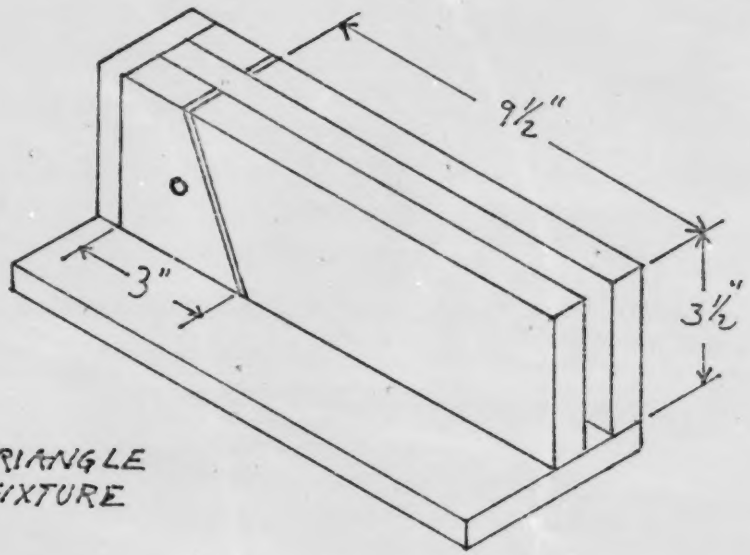




58

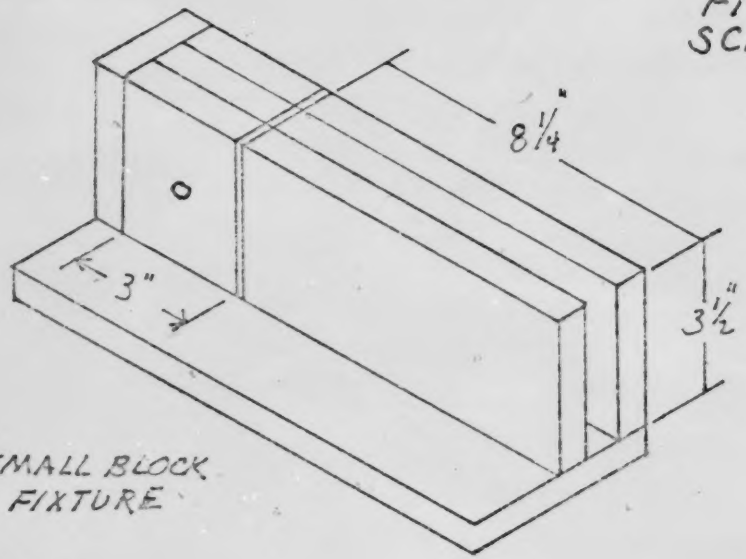


BASE & DOWEL FIXTURE

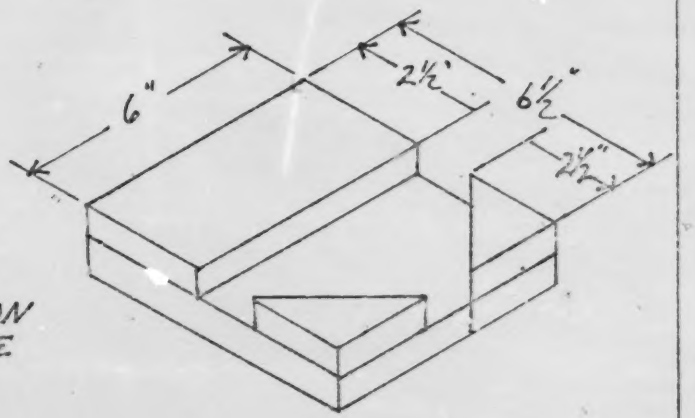


TRIANGLE FIXTURE

MASS PRODUCTION FIXTURES SCALE 1"=¼"



SMALL BLOCK FIXTURE



HEXAGON FIXTURE

49.

Project # 5

Box

Description :

The box is made entirely of clear pine 1"x6". 3 pieces are 12" long, 2 pieces are 7" long and 1 piece is 5 1/2" long. The box is designed to have a separator piece in the middle. The main purposes of this project are to have the childrens' imagination stimulated, give experience in measuring and develop the concept of part-whole relationships.

Materials and Tools Required :

Materials

1. 5' 1"x6" clear pine
2. 20 #6x1 1/4" wood screws
3. Sandpaper 100 grit
4. Paint

Tools

1. Cross-cut saw
2. Ruler
3. Tri-square
4. Pencil
5. Sur-form/file
6. Screw driver
7. Hand drill & 1/8" bit

Preparation :

1. The I.A. Instructor should :
   a. Make prototype.
   b. Ensure all tools and materials are present.
   c. Make sure that the children know exactly what you want them to do.
2. The Special Ed. Instructor should :
   a. Develop lesson on how different parts make up a whole project.

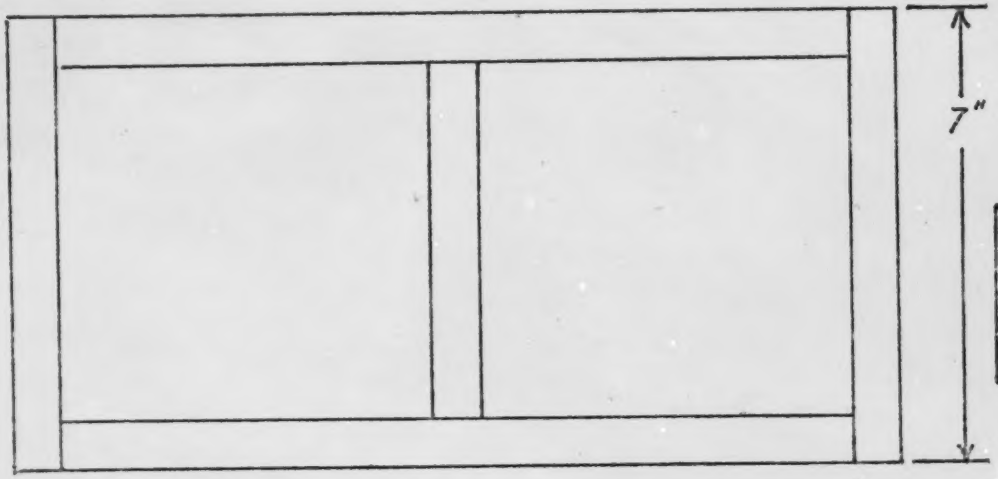
Procedure:

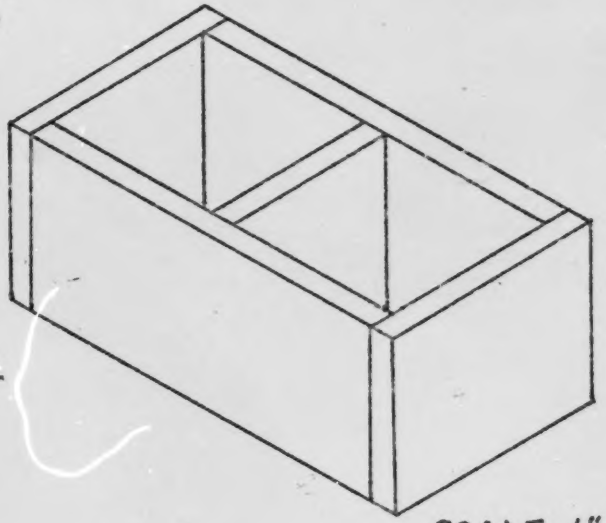
1. Measure a 12" piece and mark.
2. Draw straight line across the wood with a tri-square.
3. Cut piece with cross cut saw.
4. Repeat steps 1, 2, and 3 until 3 pieces have been cut.
5. Measure a 7" piece and mark.
6. Draw a straight line across the wood with a tri-square.
7. Cut with cross cut saw.
8. Repeat steps 5, 6, and 7 until 2 pieces have been cut.
9. Measure 5, 1/2" piece and mark.
10. Draw straight line with tri-square.
11. Cut with cross cut saw.
12. Smooth all rough edges with sur-form, file or sandpaper.
13. Drill 4, 1/8" holes approximately 1/2" up from the bottom edge, 3" apart using 2 of the 12" pieces.
14. Drill 7, 1/8" holes approximately 1/2" in from the edge on 3 sides of the 7 inch pieces.
15. Drill 2 holes in the edges of the 5 1/2" centerpiece.
16. Screw 2,12" pieces into the third 12" piece.
17. Screw 2, 7" pieces into the ends of the 12" piece.
18. Screw remaining piece into the inside of the box.
19. Clean and paint.

Behavioral Objectives:

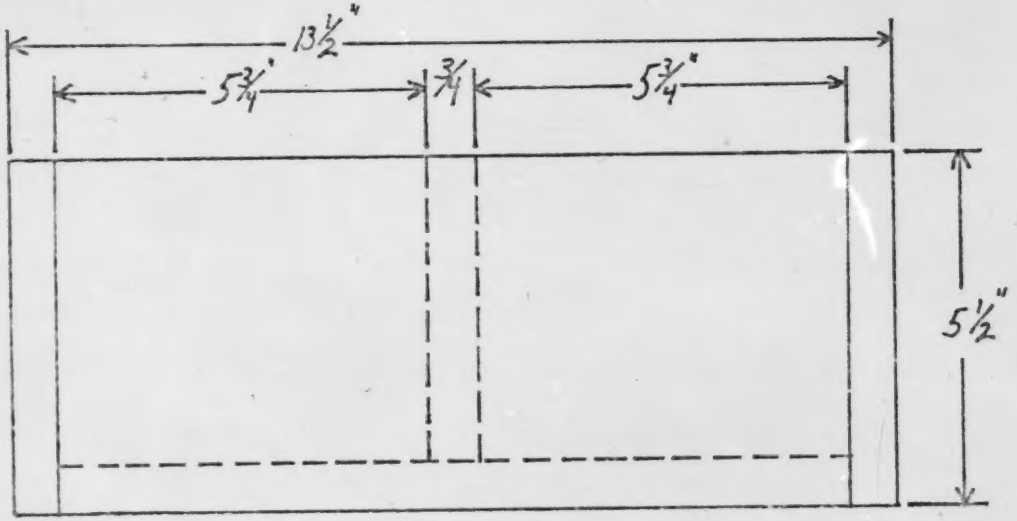
1. Upon completion of this project the student will be able to correctly indentify and use the following tools:
   a. Cross cut saw
   b. Ruler
   c. Tri-square
   d. Hand drill
   e. Sur-form
   f. File
2. As a result of this project the student will develop the following sensory-motor skills:
   a. By using the cross cut saw, the student will develop eye-hand coordination.
   b. Through the use of a screwdriver, the student will develop muscle tone and muscle coordination.
   c. The student will develop the concept of part-whole relationships by seeing how the various pieces make up a whole project.
3. The student will become more responsible by completing at least 3 steps before checking with the instructor.
4. The student's imagination will be stimulated by ask-her/him the various ways the box can be used.
5. The student will build self-confidence by the instructor giving praise for the child's work.
6. The student will develop color discrimination and creativity by choosing the color to paint the box.

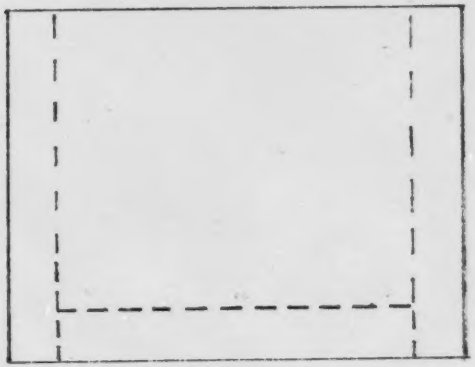
ANYTHING BOX





SCALE 1" = 3/16"





SCALE 1" = 3/8"

53.

Project # 6

Bookends

Description of Project :

The bookends are made from 1"x4"x8" clear pine,1/4" masonite and 20 gauge galvanized sheet metal. The masonite is cut in the shape of a dog and the sheet metal is attached to the back of the pine with 2 round head wood screws. The purposes of this project are to; introduce to the student the process of staining wood,develop the concept of how different materials are used to make a single product, build eye-hand cordination and to make a useful project.

Materials and Tools Required :

Materials	Tools
1. 2 pieces 1x4x8" clear pine	1. Cross-cut saw
2. 2pieces 1/4x2 1/2x6 1/2" masonite	2. Hammer
3. 2 pieces 4 1/2x6 1/2" 20 ga. sheet metal	3. Screwdriver
4. 4 # 6 round head wood screws	4. Coping saw
5. Sandpaper 100 grit	5. Sur-form
6. Playtex gloves	6. Half-round file
7. Stain	7. Bench vise
8. Playtex gloves	8. C-Clamp
9. 4 3/4" brass brads	9. Ruler
10. Rags	10. Pencil
11. Polyurethene	11. Tri-square
12. Fine steel wool	12. Hand drill
	13. 1/8" drill bit
	14. Template

Procedure :

1. Measure 8" piece of pine and mark.
2. Draw straight line across wood with tri-square.
3. Place wood in vise.
4. Cut piece with cross cut saw.
5. Repeat steps 1-4 .
6. Trace template onto masonite.
7. Place in vise.
8. Cut out shape with coping saw.
9. Repeat steps 6-8.
10. Using sandpaper, sur-form or file smooth and shape all pieces.
11. Put on playtex gloves.
12. Stain pine with rag ensuring smooth even coat.
13. Let stain dry completly before handling.
14. Smooth rough spots with steel wool.
15. Apply coat of polyurethene.
16. Let dry completly before handling.
17. Paint dog shapes.
18. Paint pre-formed sheet metal.
19. Attach dogs to front of pine with 2 brass brads.
20. Drill 2 small holes in back of each piece of sheet metal approx. 1" in from each edge.
21. Attach sheet metal to the back of wood with 2 small screws.

Preparation :

1. The I.A. Instructor should :
   a. Make prototype.
   b. Preform sheet metal pieces.

Preparation (cont.)

c. Ensure all materials and tools needed are available.

d. Develop short introduction on the staining process.

e. Be certain that the students know exactly what you want them to do.

2. The Special Ed. Instructor should :

a. Discuss with students how different materials can be used to make up a single project.

b. Discuss with the students how bookends are a useful item for keeping books in place.

Behavioral Objectives :

1. As a result of this project the student will develop the following sensory-motor skills :

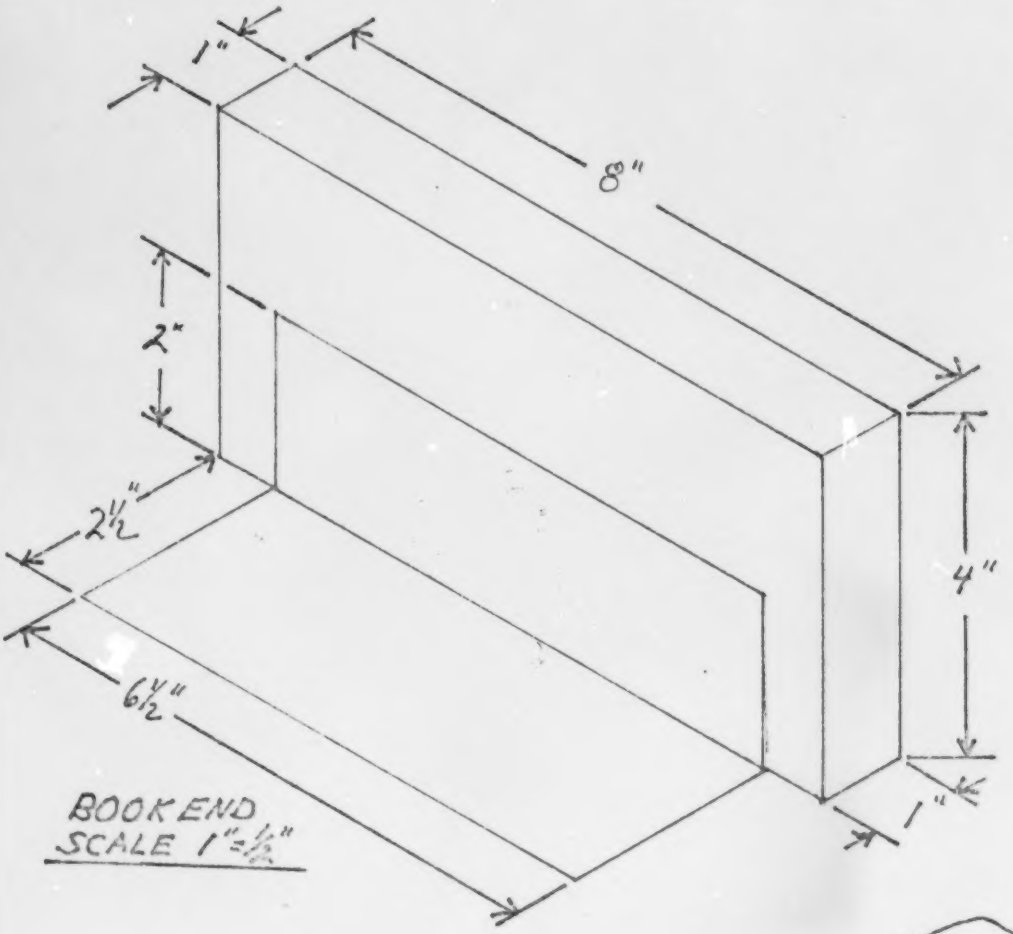
a. The student will build eye-hand cordination by using the coping and cutting a straight line with the cross cut saw.

b. Auditory discrimination by listening to directions.

2. The student will demonstrate the correct procedure for staining wood.

3. The student will build self-confidence by completing at least five (5) steps of the project before checking with the instructor.

BOOK ENDS



BOOKEND
SCALE 1"=1"

TEMPLATE
SCALE 1"=1"

Project # 7

Key Holder

Description of Project :

The keyholder is made of 1"x4"x8" clear pine. It is cut in the shape of a key and small brass hooks are screwed into it to hang the keys. A small hole is drilled in the top center so the holder can be attached to a wall. The main purposes of this project are to build self-confidence and establish a sense of worth at home by making a useful household item.

Materials and Tools Required :

Materials

1. 1"x4"x8" clear pine
2. 6 small brass hooks
3. Paint or stain
4. Sandpaper

Tools

1. Coping saw
2. Bench vise
3. Template
4. Pencil
5. Bit brace
6. 7/16" bit
7. Tri-square
8. Cross cut saw
9. Ruler
10. File/Sur-form

Procedure :

1. Measure 8" piece of pine and mark.
2. Draw straight line across wood with tri-square.
3. Cut with cross cut saw.
4. Trace template onto wood.
5. Cut out shape with coping saw.
6. Smooth all surfaces with sandpaper, sur-form or file.

Procedure (cont) :

7. Drill hole in the top of shape.

8. Paint or stain.

9. Attach brass hooks.

Preparation :

1. The I.A. Instructor should :

    1. Make prototype.

    2. Make template.

    3. Ensure all materials and tools required are available.

    4. Make sure that the students know exactly what you want them to do.

2. The Special Ed. Instructor should :

    1. Discuss with students how a keyholder is useful in keeping keys in a place that can easily be found.

Behavioral Objectives :

1. As a result of this project the student will develop the following sensory - motor skills :

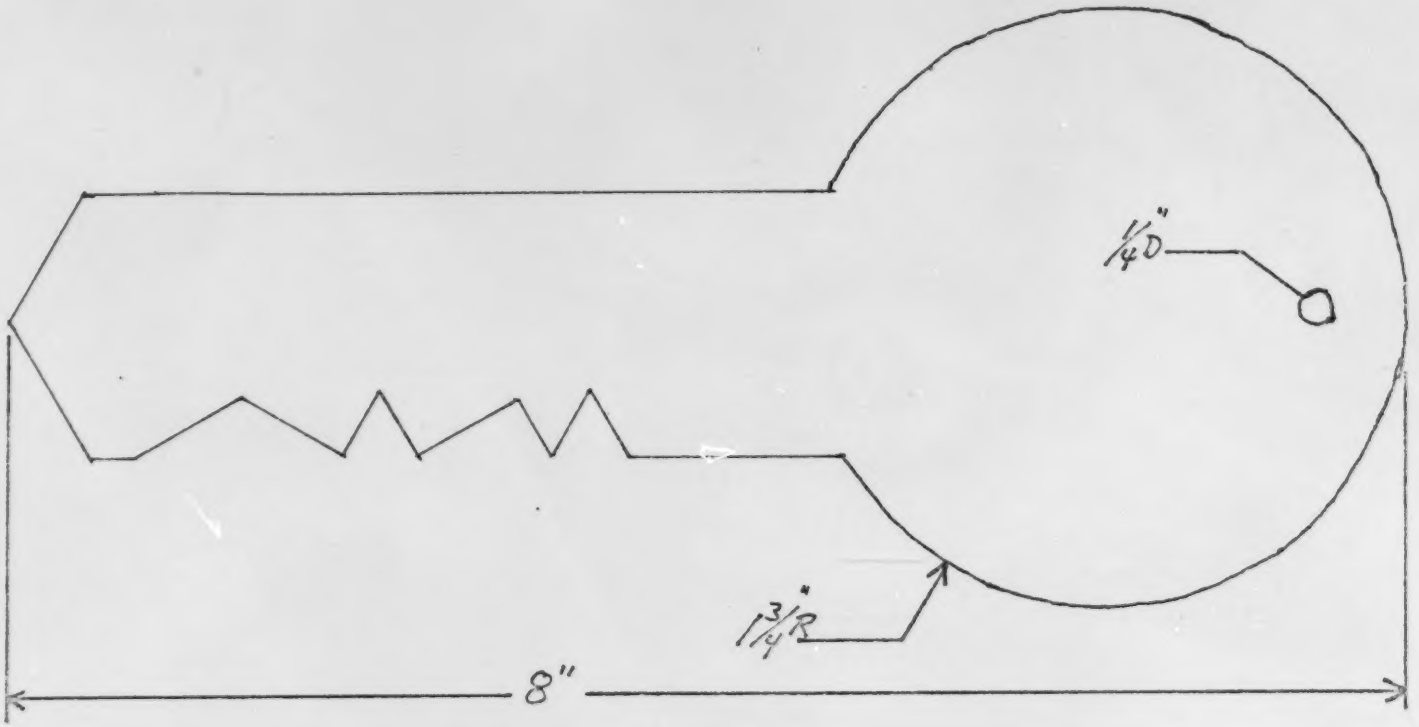
    a. eye-hand cordination will be developed through the use of the coping saw, cross-cut saw and the tri-square.

    b. auditory discrimination will be improved by listening and following directions

    c. muscle tone and cordination will be developed by screwing the brass hooks into the key holder.

2. The student will develop compatibility by sharing tools and working with others on the project.

KEY RACK



SCALE 1"=1"
TEMPLATE

60.09

Project # 8

Coat Rack

Description of project :

The coat rack is made from 1"x4"x12" fir and 1/2"x3" dowels. The dowels are set at 30 degree angles 3" apart. The holes are drilled in the base at 30 degree angles with the aid of a jig. The dowels are then glued in place with Elmer's Glue. A 1/4" hole is drilled 1" in from either end of the base so the rack can be attached to a door or wall.

Materials and Tools Required :

Materials	Tools
1. 1 pc. 1"x4"x12" fir	1. Ruler
2. 1 pc. 1/2"x9 3/8" dowel	2. Pencil
3. Elmer's Glue	3. Tri-square
4. Sandpaper	4. Cross-cut saw
	5. Bit brace
	6. 1/2" auger bit
	7. Bench vise
	8. Jig

Preparation :

1. The I.A. Instructor should :
   a. Make prototype ,
   b. Make 3 holed jig with holes 3" apart and 3" in from each end,
   c. Make sure all tools and materials needed are present,
   d. Ensure students know exactly what you want them to do.

Preparation:

2. The Special Ed Instructor should :

   a. Discuss measurement with students.

   b. Discuss the value of organization with students, this could include the use of the coat rack as a means to organize personal property.

Procedure :

1. Measure 12" on piece of fir and mark.
2. Draw straight line across the wood with a tri-square.
3. Place wood in vise.
4. Cut on outside of line with a cross-cut saw.
5. Place jig on piece of fir and have one student hold it in place.
6. Drill 3 holes with 1/2" auger bit being careful not to drill all the way through the wood.
7. Remove jig.
8. Measure 3" on dowel and mark.
9. Cut with cross-cut saw.
10. Repeat steps 8 and 9 until three pieces have been cut.
11. Smooth all pieces of the project with sandpaper and file.
12. Place small amount of Elmer's Glue in each hole.
13. Place small amount of Elmer's Glue on each dowel and insert into holes.
14. Remove excess glue.

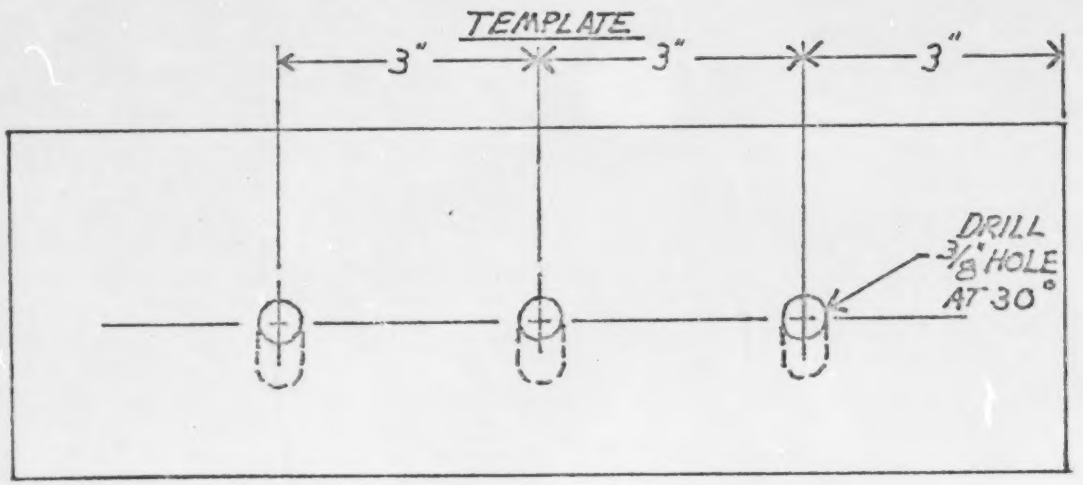
Behavioral Objectives :

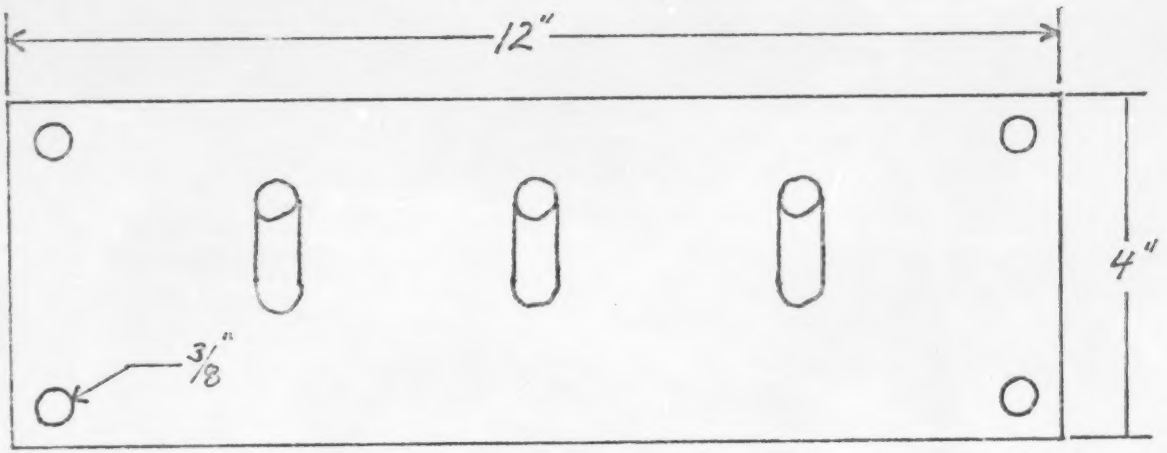
1. The student will develop, concept of measurement

Behavioral Objectives (cont) :

2. The student will be able to correctly identify and use the following tools :
   a. Ruler
   b. Tri-square
   c. Cross-cut saw
   d. Jig
   e. Bit brace
   f. Bench vise
3. The student will develop socially by working with others.
4. The student will develop the following sensory-motor skills :
   a. Eye-hand cordination through the use of the cross-cut saw, ruler, tri-square and bit brace.
   b. Auditory discrimination by listening to and following directions.
5. The student will develop a stronger sense of worth at home by making a useful household item.
6. The student will develop self-confidence and responsibility by completing at least 7 steps of the project before checking with the instructor.

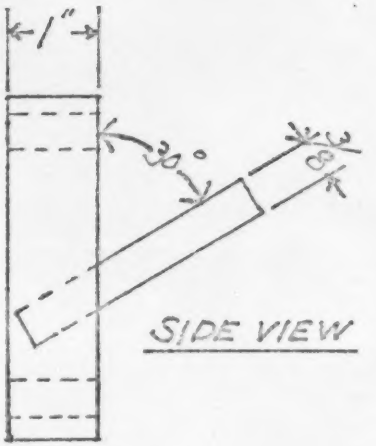
COAT RACK





77

FRONT VIEW



78

SIDE VIEW

SCALE 1" = 1/2"

Project # 9

Cutting Board

Description of Project :

The cutting board is made from a 1"x8"x10" piece of pine. It is cut in the shape of a fish, with a hole in the top center to hang it up. After the project has been cut and sanded, vegetable oil is rubbed into it for preservation and use. The purpose of this project is to give the children something that is easy and fun to make and at the same time develop a stronger sense of worth at home by making a useful household item.

Materials and Tools Required :

Materials	Tools
1. 1 pc. 1"x8"x10" pine	1. Coping saw
2. Sandpaper 100 grit	2. Cross-cut saw
3. Vegetable oil	3. Bench vise
4. Paper towels	4. C-Clamp
	5. Hand drill & $\frac{1}{4}$"bit
	6. Sur-form
	7. File (half-round)
	8. Tri-square
	9. Template
	10. Pencil
	11. Ruler

Preparation :

1. The I.A. Instructor should :
   a. Make prototpye.
   b. Make template .

Preparation (cont)

c. Ensure all tools and materials are available.

d. Develop short lecture on oil application.

e. Make sure that the students know exactly what you want them to do.

2. The Special Ed. Instructor should :

a. Discuss with students the use of a cutting board and emphasize it's usefulness as a household item.

Procedure :

1. Measure 10" piece of pine.
2. Draw straight line across wood utilizing a tri-square.
3. Put in vise.
4. Cut along line with cross-cut saw.
5. Remove from vise.
6. Trace template onto the wood.
7. Put piece with outline into vise or clamp to bench with a C-Clamp.
8. Cut out shape with a coping saw.
9. Drill 1/4" hole in top center.
10. Smooth and shape all surfaces with sandpaper, file or sur-form.
11. Apply vegetable oil in thin coats until wood becomes saturated.
12. Wipe off excess oil with a paper towel.

Behavioral Objectives :

1. The student will develop the following sensory-motor skills :

Behavioral Objectives (cont) :

a. Through the use of the coping saw, cross-cut saw, tracing the template, using the hand drill and the tri-square, the student will develop eye-hand cordination.

b. By listening to and following directions the student will develop auditory discrimination.

2. The student will be able to correctly identify and use the following tools :

a. Ruler
b. Coping saw
c. Tri-square
d. Cross-cut saw
e. Bench vise
f. C-Clamp
g. Sur-form
h. File
i. Hand drill
j. Template

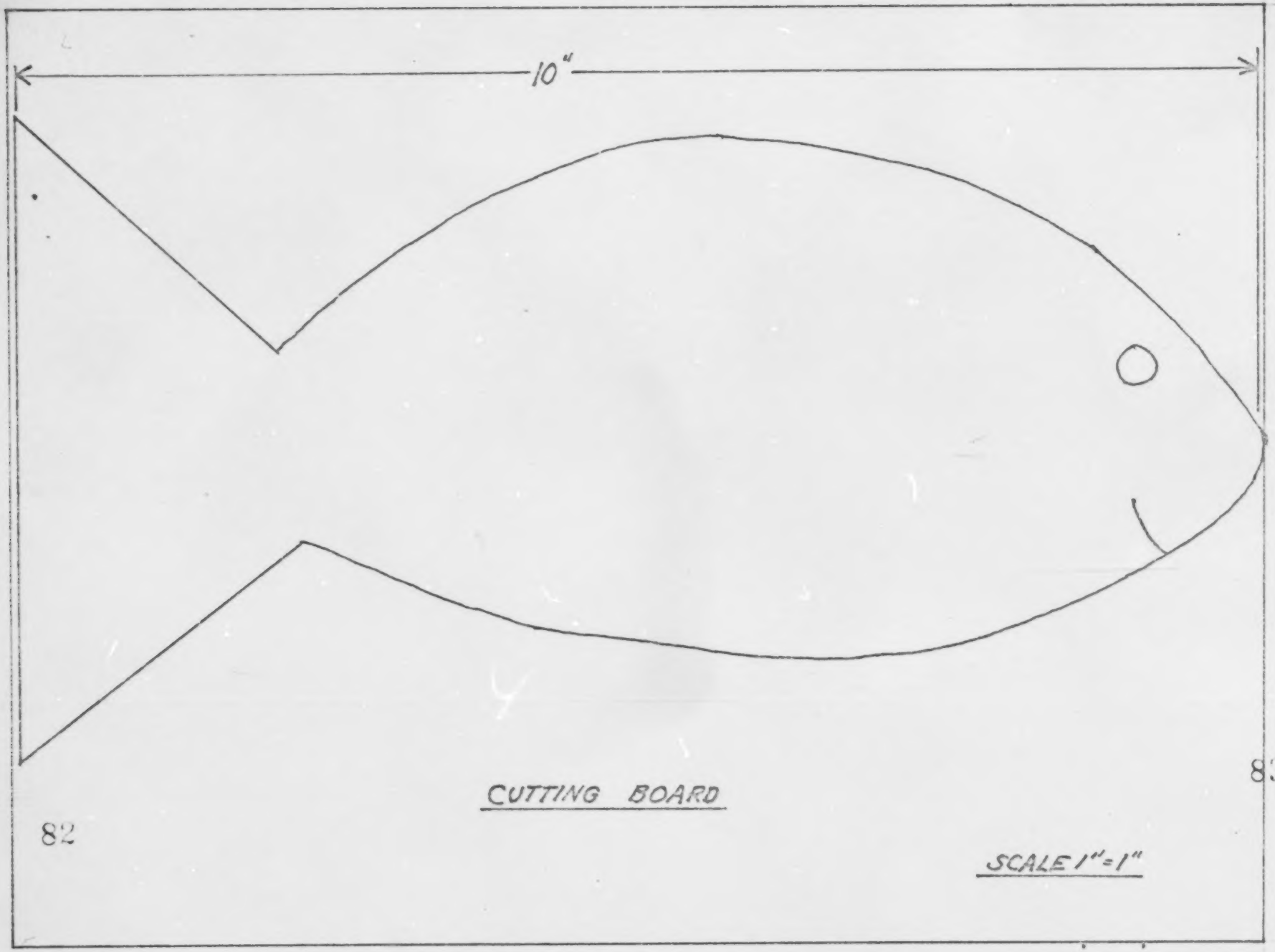
3. The student will develop a sense of worth at home by making a useful household item.

4. The student's imagination will be stimulated by the different uses of the cutting board.

5. The student will develop socially by working with others.

6. The student will develop self-confidence by completing at least five steps of the project before checking with the instructor.

7. By completing a successful project the student will be motivated to pursue future I.A. Activities.



CUTTING BOARD

SCALE 1"=1"

82

83

Project # 10

Ring-Toss Game

Description of Project :

The figure is cut from a piece of 1"x4"x8½" clear pine. The detail for the face is first put on with a pencil and is then traced over with an artists small paint brush. A small hole 1/4" in diameter is drilled at the base of the chin, this is done to put a 3' piece of heavy string through it. The main purpose of this project is to give the children a project that they can use as a leisure time activity.

Materials and Tools Required :

Materials	Tools
1. 1 piece of 1"x4"x8½" clear pine	1. Coping saw
2. Paint	2. Cross cut saw
3. Small artists paint brush	3. Tri-square
4. Rubber ring from glass jar	4. Hand drill
5. 3' of heavy string	5. 1/4" drill bit
6. Sandpaper 100 grit	6. Pencil
	7. Sur-form
	8. File
	9. Template
	10. Ruler
	11. Vise or C-Clamp

Preparation :

1. The I.A. Instructor should :
   a. Make prototype.
   b. Ensure that all materials and tools are available.

Preparation (cont) :

c. Make sure that the children know exactly what you want them to do.

2. The Special Ed. Instructor should :

a. .Discuss with the students the different possibilities of games that could be played with this device.

Procedure :

1. Measure 8½" on a piece of pine and mark.
2. Draw a straight line across the wood utlizing a tri-square.
3. Put wood in vise.
4. Cut along the line with a cross cut saw.
5. Remove from the vise.
6. Trace template onto the wood.
7. Put wood in vise or c-clamp.
8. Cut out shape with a coping saw .
9. Remove from vise/clamp .
10. Drill small hole in the chin of the shape .
11. Smooth all surfaces with sandpaper, sur-form or file.
12. Draw facial features with a pencil.
13. Paint over pencil lines with artists brush .
14. Attach piece of string to the chin of the shape.
15. Attach rubber seal to the end of the string .

Behavioral Objectives :

1. The student will develop the following sensory - motor skills :

Behavioral Objectives (cont) :

a. Eye-hand cordination through the use of the coping saw, cross cut saw and drawing facial lines with a pencil and a brush.

b. Auditory discrimination by listening and following directions .

2. The student will be able to correctly identify and use the following tools :

a. Coping saw

b. Cross cut saw

c. Tri-square

d. Bench vise

e. C-Clamp

f. Hand drill

g. Template

h. Sur-form

i. Half-round file

3. The student's imagination will be stimulated by the instructor asking the various ways the game can be played.

4. The student will develop compatibility by working and sharing tools with other students .

RING TOSS GAME
SCALE 1" = 1"
87
88

Posttest

A postest should be administered to the students at the completion of the projects for the Industrial Arts program. This is one indication of the learning that has transpired because of the program.

This information can be used when making a comprehensive evaluation of the students progress for the school system and/or parents. Also, the information can be used to justify continued and/or expanded programs.

For validity, the postest tests the same tools on the same form as the pretest does. Remember to circle the proper test heading to indicate either pretest or posttest.

SUPPLIES

1. Elmer's Glue (lrg.)
2. Pencils (1 bx.)
3. Scissors
4. Assortment of Nails and Brads
5. 1/2 x #6 Flat Head Screws (1 bx.)
6. 3/4 x #10 FHS (1 bx.)
7. Sand Paper (Fine - Medium - Course)
8. Masking Tape (1 roll)

Suggested Tool List for Class of Ten

	Type	Quantity
1.	Wood Vice (Stanley 5" jaw)	10
2.	Coping Saw	10
3.	Hand Drill with Bits	3
4.	Jr. Jack Plane	2
5.	Slip Joint Pliers	6
6.	Bit Brace	3
7.	'C' Clamps($2\frac{1}{2}$ x $2\frac{1}{2}$)	10
8.	12 oz. Hammer, st. claw	10
9.	12" Surform, straight	10
10.	4" Surform, straight	10
11.	Round File Surform	5
12.	26" Rip Saw	3
13.	20" Crosscut Saw	5
14.	6" Square	5
15.	Auger Bit Set	1
16.	Dual Scale Ruler (Metric and inches)	10
17.	6" Flat Blade Screw Driver	10
18.	Safety Glasses (Min. 1/student)	10 pair
19.	Scissors	10 pair
20.	Back Saw	1

The above list was based on 10 students.

Appendix I

Appendix I is a final evaluation form that can be utilized by the instructor of an EMR program to measure the individual student's comprehension, performance, and attitudes at the end of the program. This evaluation is only intented to serve as one example. The instructor is invited to use this form in full or any modified parts to compile a final evaluation.

Appendix I - Final Evaluation

LEARNING AND COMPREHENSION

1. Responses to Instruction:

   a. Needs little instruction and is able to follow through on task.
   b. Needs moderate amount of instruction and then is able to follow through on a task.
   c. Needs a great deal of instruction and then is able to follow through on a task.
   d. Even with a great deal of instruction was unable to follow through on a task.

2. Concentration:

   a. Gives constant attention to task at hand.
   b. Periodically attentive to task at hand.
   c. Seldom attentive to task at hand.
   d. Unable to attend to task at hand (constantly distracted).

3. Adjustability to New Task:

   a. Adjusts easily to new assignments.
   b. Adjusts with some difficulty to new assignments.
   c. Cannot adjust to task .

4. Retention of Learned Job Skills:

   a. Needs no reinstruction.
   b. Needs periodic reinstruction.
   c. Needs constant reinstruction.

Performance

1. Frustration Tolerance:

   a. Generally sticks to task in face of obstacles or setbacks.
   b. Generally sticks to job but may show some distress.
   c. Has considerable difficulty in sticking to task when faced with obstacles.
   d. Cannot tolerate any obstacles to complete task.

2. Manual Dexterity:

   a. Manipulative skills are good in most all areas.
   b. Has occasional manipulative difficulty but shows capabilities.
   c. Has considerable difficulty using hands.
   d. Is inept at using hands for manipulative skills.

3. Consistency of Effort:

   a. Constantly puts effort into his task.
   b. Puts some effort into doing task.
   c. Puts ro effort into his task.

4. Use of Judgment:

   a. Does he assess the situation, and if so, what does he/she do?
   b. Does he/she use good judgment, or just blunder ahead?
   c. Is his/her judgment adequate for the task?

_____

_____

Attitude

1. Reaction:

   a. Describe the student's reaction to pressure for improved behavior or task performance.

   b. Describe areas in which the student express or otherwise shows intrest in.

Personality and Social Evaluation

We know that a child's ability to function in school is significantly relatedto his mental and emotional health. Some of the items listed reflect the child's attitudes toward himself and toward his school work. Others indicate the quality of his relationships with peers and adults. Obviously, these are areas where both the home and the school have great influence in helping to develop good mental health and social behavior. If the instructor feels that any particular question is not applicable, leave that question blank.

Self Concept:

A. Is he aware of the purpose of the learning environment?
B. Does he accurately estimate his own ability?
C. Does he face problems of his own, seeking help when necessary?
D. Does he show perseverance?
E. Does he express realistic satisfaction with his accomplishments?
F. Is he accepting of himself?

Self Direction and Self Control:

A. Does he show interest in learning and in improving his abilities?
B. Does he show dependable carry through with his individual responsibilities?
C. Does he assume his part in group activities?
D. Is he developing ability to express himself freely, yet maintaining appropriate self-control?

(cont'd)

Relationships with Others:

A. Does he show sensitivity to and respect for the interest, welfare and property of others?
B. Does he relate well to adults?
C. Does he relate well to children?
D. Does he display acceptable manners?
E. Is he overly shy, overly aggressive?

Work Habits

A. Is conscientious
B. Follows directions
C. Has persistence
D. Works independently
E. Utilizes time well
F. Displays appropriate attitudes

Instructor's Written Summary

Appendix II

Appendix II is an evaluation of vocational behavior criteria. This is one possible evaluation that the Industrial Arts Instructor could use for an evaluation on an Individualized Education Plan. This is only one example of the type of form that could be utilized in meeting the requirements of the IEP.

VOCATIONAL BEHAVIOR SCALE CRITERIA

1. INITIATES TASKS
After arriving, student proceeds with routine without delay.
(1) Hardly ever
(2) Ocasionally
(3) Half the time
(4) Frequently
(5) Nearly always

2. REMEMBERS INSTRUCTIONS
After the task has been explained, the student needs the instructions repeated to perform the task independently and correctly.
(1) Nearly always
(2) Frequently
(3) Half the time
(4) Ocasionally
(5) Hardly ever

3. FOLLOWS INSTRUCTIONS
(1) When they are accompanied by demonstration, only one specfic task.
(2) When they are accompanied by demonstration, with two tasks per job.
(3) When they are accompanied by demonstration, with three tasks per job.
(4) When they are accompanied by demonstration, with four tasks per job.
(5) Without accompanied demonstration, with verbal instructions for two or more tasks per job.

4. ATTENTION TO TASKS
(1) Will not pay attention to task activities for as long as 5 minutes.
(2) Will pay attention to task for at least 5 minutes.
(3) Will pay attention to task for at least 10 minutes.
(4) Will pay attention to task for at least 15 minutes.
(5) Will pay attention to task for more than 15 minutes.

5. PERSISTENCE
(1) Fails to carry out tasks.
(2) Needs constant encouragement to work at a specfic task.
(3) Will work but will jump from one task activity to another.
(4) Needs some encouragement to complete a specfic job.
(5) Rarely fails to carry out tasks, never discouraged.

6. COOPERATION
(1) Rarely helps others.
(2) Helps others only with much coaxing.
(3) Is willing to help others if asked.
(4) Sometimes offers assistance.
(5) Always offers assistance to others.

7. SPECIFYING THE UNCLEAR
(1) Does not understand directions and does not attempt to perform.

(2) Indicates he does not understand only after attempt has been made.
(3) Indicates before attempting that he does not understand.
(4) Indicates in general terms what is unclear.
(5) Indicates specfically what is unclear.

8. TASK IMPROVEMENT
(1) Must be completely reoriented to previously learned tasks.
(2) Mus t be given a number of specfic details before he can perform task.
(3) Needs one specfic detail before he is able to pursue task.
(4) Can pursue the previous learned task with no further instruction.

9. TIME IN COMPLETING TASK
(1) Far below average.
(2) Fair but below average.
(3) Satisfactory but below average.
(4) Average.
(5) Above average.

10. ADEQUACY OF PERFORMANCE-STUDENT'S WORK HAS TO BE REDONE
(1) Nearly always.
(2) Frequently.
(3) Half the time.
(4) Frequently.
(5) Hardly ever.

11. SEEKING HELP
When having difficulty with a task, the student seeks help.
(1) Hardly ever.
(2) Occasionally
(3) Half the time.
(4) Frequently.
(5) Nearly always.

12. SOCIAL MATURITY
(1) Does not socialize appropriately with co-workers, teachers, and strangers.
(2) Does not understand social sublety i.e. friends and strangers all treated in the same familiar manner.
(3) Some social maturity.
(4) Satisfactory social habits, but still room for improvement.
(5) Socializes appropriately with co-workers, teachers and strangers.

13. REACTION TO CRITICISM
(1) Cannot accept criticism, withdraws, reacts negatively.
(2) Shows some rejection reaction to criticism, work is effected.
(3) Some reaction but capable of accepting criticism.
(4) Accepts criticism and reacts appropriately.
(5) Reacts favorably to criticism, reacts quickly and easily.

14. MANNERS
(1) Is not polite or courteous.
(2) Is polite ocasionally.
(3) Is polite half the time.
(4) Is polite often.
(5) Is polite nearly always.

15. ATTITUDE
(1) Poor
(2) Fair
(3) Satisfactory
(4) Very good
(5) Excellent

16. ATTENDANCE
(1) Poor
(2) Fair
(3) Satisfactory
(4) Very good
(5) Excellent

VOCATIONAL BEHAVIOR SCALE

STUDENT: _____

DATE																		
1) INITIATES TASKS																		
2) REMEMBERS INSTRUCTIONS																		
3) FOLLOWS DIRECTIONS																		
4) ATTENTION TO TASKS																		
5) PERSISTANCE																		
6) COOPERATION																		
7) SPECIFYING THE UNCLEAR																		
8) TASK IMPROVEMENT																		
9) TIME IN COMPLETING TASK																		
10) ADEQUACY OF PERFORMANCE																		
11) SEEKING HELP																		
12) SOCIAL MATURITY																		
13) REACTION TO CRITICISM																		
14) MANNERS																		
15) ATTITUDE																		
16) ATTENDANCE																		

Bibliography

General

Kolstoe, Oliver P. Mental Retardation: An Educational Viewpoint. New York: Holt, Rinehart and Winston, Inc., 1972.

Kolstoe, Oliver P. Teaching Educable Mentally Retarded Students. New York: Holt, Rinehart and Winston, Inc., 1970.

Rothstein, Jerome H. Mental Retardation: Readings and Resources, 2d.ed. New York: Holt, Rinehart and Winston, Inc., 1970.

Kirk, Samuel A. Educating Exceptional Children, 2d.ed. Boston: Houghton Mifflin Company, 1972.

Dunn, Rita, and Dunn, Kenneth. Practical Approaches to Individualizing Instruction: Contracts and Other Effective Teaching Strategies. West Nyack: Parker Publishing Co., Inc., 1972.

Smith, Robert M. Clinical Teaching: Methods of Instruction for the Retarded, New York: McGraw-Hill Book Co., 1968.

Endicott, Robert F. Scrap Wood Fun for Kids, New York: Bonanza Books, 1956.

Bibliography

Special

Williams, Michael, J., and Frost, Kenneth, and Tracy, Allen. A Curriculum Guide for Industrial Arts Activities for Children with Emotional Problems. Division of Technology, Central Connecticut State College, New Britain, Ct., 1976.

Williams, Michael, J.,(ed.). A Curriculum Guide for Industrial Arts in the Elementary School. Division of Technology, Central Connecticut State College, New Britain, Ct., 1976.

Curriculum Guide for the Special Student in the Middle Years: A Resource for Teachers. Board of Education of Baltimore County, Baltimore, Md., 1973.

A Guide for Teachers of the Educable Mentally Handicapped: Elementary Level. Special Education Unit, Santa Fe, New Mexico, 1974.

Educable Mentally Retarded Curriculum Guide: (Primary). The Curriculum Development Project for EMR, Lake Butler, Florida, 1974.

A Guide to Assist Industrial Arts Teachers in Teaching Special Class Pupils of Secondary School Ages. Indiana County Public Schools, Special Education Department, Indiana, Penn., 1976.

Bibliography

Periodicals

MacMillan, D.L. "Effects of Experimental Sucess and Failure on the Situational Expectancy of EMR and Non-retarded Children," American Journal of Mental Deficiency, 80 (July,1975), 90-95.

Evans, R.A., and Bilsky, I.H. "Effects of Letter Reversals Training on the Discrimination Performance of EMR Children," American Journal of Mental Deficiency, 80 (July,1975), 99-108.

Prillaman, Douglas. " Analysis of Placement Factors in Classes for the Educable Mentally Retarded," Exceptional Child, 42 (Oct.,1975), 107-108.

Holzberg, R. "Educable Retarded," Science and Child, 13 (Mar.,1976), p.19.

Gillilan, James O., and Katz, Gary R. "An I.A. Experience for the Educable Mentally Retarded Child," Man/Society/ Technology, 35 (April,1976), p.214.